



APPENDIX A

AGENCY CORRESPONDENCE





United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 ADMIRAL COCHRANE DRIVE
ANNAPOLIS, MD 21401

PHONE: (410)573-4599 FAX: (410)266-9127

URL: www.fws.gov/chesapeakebay/;

www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html



Consultation Code: 05E2CB00-2016-SLI-1284

June 07, 2016

Event Code: 05E2CB00-2016-E-01393

Project Name: Hanover Street Bridge

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.





A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Official Species List

Provided by:

Chesapeake Bay Ecological Services Field Office

177 ADMIRAL COCHRANE DRIVE

ANNAPOLIS, MD 21401

(410) 573-4599

<http://www.fws.gov/chesapeakebay/>

<http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html>

Consultation Code: 05E2CB00-2016-SLI-1284

Event Code: 05E2CB00-2016-E-01393

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Name: Hanover Street Bridge

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

<http://ecos.fws.gov/ipac>, 06/07/2016 11:27 AM

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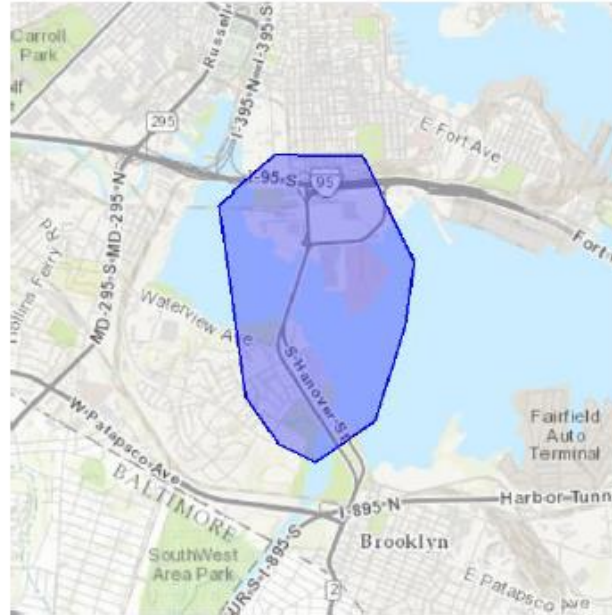




United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-76.6032886505127 39.26056938451655, -76.60869598388672 39.269208214670165, -76.61822319030762 39.26934111143279, -76.62423133850096 39.265221194601, -76.62131309509277 39.24933731353679, -76.61779403686523 39.24548210522639, -76.61384582519531 39.244019729396214, -76.60749435424805 39.24747620494899, -76.60414695739746 39.25531911376339, -76.6032886505127 39.26056938451655)))

Project Counties: Baltimore (city), MD

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United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Endangered Species Act Species List

There are a total of 0 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

There are no listed species identified for the vicinity of your project.

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CATHERINE E. PUGH
MAYOR



DEPARTMENT OF TRANSPORTATION
BALTIMORE CITY



United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Critical habitats that lie within your project area

There are no critical habitats within your project area.

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United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.

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United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

Appendix B: NWI Wetlands

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Exclusions - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of

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United States Department of Interior
Fish and Wildlife Service

Project name: Hanover Street Bridge

this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

The following NWI Wetland types intersect your project area in one or more locations. To understand the NWI Classification Code, see <http://wetlandsfws.usgs.gov/Data/interpreters/wetlands.aspx>.

Wetland Types	NWI Classification Code
Estuarine and Marine Deepwater	E1UBL6
Estuarine and Marine Deepwater	E1UBL
Estuarine and Marine Wetland	E2EM1P
Estuarine and Marine Wetland	E2EM1P6
Freshwater Emergent Wetland	PEM1Ax
Freshwater Emergent Wetland	PEM1Fx
Freshwater Pond	PUBFx

<http://ecos.fws.gov/ipac>, 06/07/2016 11:27 AM - Appendix B





Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Mark Belton, Secretary
Joanne Thrope, Deputy Secretary

June 13, 2016

Ms. Amanda Deering
Straughan Environmental Services, Inc.
10245 Old Columbia Road
Columbia, Maryland 21046

RE: Environmental Review for Baltimore City Hanover Street Bridge Corridor Plan, City of Baltimore, Maryland.

Dear Ms. Deering:

The Wildlife and Heritage Service has determined that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. We would also like to point out that the open waters that are adjacent to the southeastern part of the site are known historic waterfowl concentration areas. If there is to be any construction of water-dependent facilities please contact Josh Homyack of the Wildlife and Heritage Service at (410) 928-3650 or josh.homyack@maryland.gov for further technical assistance regarding waterfowl. Please note that the utilization of state funds, or the need to obtain a state-authorized permit, may warrant additional evaluations that could lead to protection or survey recommendations by the Wildlife and Heritage Service.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2016.0784.bc
Cc: J. Homyack, DNR
K. Charbonneau, CAC

Tawes State Office Building – 580 Taylor Avenue – Annapolis, Maryland 21401
410-260-8DNR or toll free in Maryland 877-670-8DNR – dnr.maryland.gov – TTY Users Call via the Maryland Relay





From: Joseph Abe -DNR- <joseph.abe@maryland.gov>
Sent: Tuesday, June 28, 2016 11:04 AM
To: Amanda Deering
Cc: john.mullican@maryland.gov; Roland Limpert -DNR-
Subject: Information Concerning Fishery Resources in Hanover Street Bridge Area

Hi Amanda:

I am responding to your June 20, 2016 letter regarding the Baltimore City Hanover Street Bridge Corridor Plan. Using our Coastal Atlas (<http://dnr2.maryland.gov/ccs/Pages/coastalatlantlas.aspx>), I found:

Herring Spawning Habitat
 Herring Juvenile Habitat
 White Perch Juvenile Habitat

in the vicinity of the project. John Mullican can put you in touch with the appropriate field biologist to get more specific and up-to-date information in this area.

John: Here's some relevant information from Amanda's letter.

"The study area includes two 8-digit watersheds: Patapsco River Lower North Branch (02130906) and Baltimore Harbor watersheds (02130903)."

Amanda requested any information concerning state threatened or endangered fishery resources, including anadromous fish that may occur in the area.

Best, Joe

--

Joe Abe

Coastal Policy Coordinator

[Chesapeake and Coastal Service](#)

Maryland Department of Natural Resources

580 Taylor Avenue, E-2

Annapolis, MD 21401

Joseph.Abe@Maryland.gov 410-260-8740





From: John Mullican -DNR- [<mailto:john.mullican@maryland.gov>]
Sent: Monday, March 20, 2017 7:42 AM
To: Amanda Deering <adeering@straughanenvironmental.com>
Cc: Joseph Abe -DNR- <joseph.abe@maryland.gov>; Chimere Lesane-Matthews <cl@straughanenvironmental.com>; Mark Staley -Dnr- <mark.staley@maryland.gov>; Paul Piavis -DNR- <paul.piavis@maryland.gov>
Subject: Re: Information Concerning Fishery Resources in Hanover Street Bridge Area

Amanda,

The Freshwater Fisheries Program Region Manager for Baltimore County is Mark Staley (copied). I have also copied Paul Piavis for comments regarding resident species.

The Hanover Street Bridge improvement project does not appear to impact any freshwater fisheries. Gwynns Falls and Jones Falls are Put-and-Take Trout Management Areas. However, stocking takes place further upstream in the watershed and would not be affected by this project.

Thank you,
John

 dnr.maryland.gov	<p>John Mullican Field Operations Manager Freshwater Fisheries Program Fishing and Boating Services Department of Natural Resources 20901 Fish Hatchery Rd. Hagerstown Md 21740 301-791-4736 (office) 443-848-0840 (cell) john.mullican@maryland.gov</p>
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[Click here](#) to complete a three question customer experience survey.





From: Mark Staley -DNR- [<mailto:mark.staley@maryland.gov>]

Sent: Tuesday, March 28, 2017 3:12 PM

To: Amanda Gould <agould@straughanenvironmental.com>

Cc: john.mullican@maryland.gov; Chimere Lesane-Matthews <cl@straughanenvironmental.com>

Subject: Re: FW: Information Concerning Fishery Resources in Hanover Street Bridge Area

Yes, I concur with John that freshwater fisheries resources will not be impacted by this project. Largemouth bass are present and a recreational resource just upstream of the Hanover St. bridge in the tidal Patapsco River.

Millions of dollars are being spent to restore anadromous fish habitat and populations in the Patapsco River upstream of the site but I am not involved with that effort.

The area around the site is heavily used by local recreational fishermen and crabbers. Any measures that could be included to allow or expand angler access would be helpful to the local community.

Mark

On Tue, Mar 28, 2017 at 2:46 PM, Amanda Gould <agould@straughanenvironmental.com> wrote:

Mr. Staley,

I am following up on John Mullican's email below regarding freshwater fisheries located near the Hanover Street Bridge Improvement Project.

In the email below, John stated that the project appeared to not impact freshwater fisheries, do you concur with this determination?

Thank you for your time and any additional information you can provide.

Amanda Gould (Deering)





From: Paul Piavis -DNR- [<mailto:paul.piavis@maryland.gov>]
Sent: Wednesday, March 29, 2017 12:45 PM
To: Amanda Gould <agould@straughanenvironmental.com>
Cc: john.mullican@maryland.gov; Chimere Lesane-Matthews <cl@straughanenvironmental.com>
Subject: Re: FW: Information Concerning Fishery Resources in Hanover Street Bridge Area

Amanda, We don't have any ongoing surveys near the project area. That being said, the Harbor Hospital area is relatively popular for recreational fishermen, generally targeting channel catfish and white perch. And they can be quite successful. the ramp at that location also provides access for at least a few kayak fishermen that pursue perch and pre-migratory striped bass. There is a high likelihood that yellow perch spawn in the middle branch area. however, given the developed nature of the area, successful spawning may already be limited.

Regardless, additional sediment input into the system due to construction should be limited in the time frame of mid February through mid April. This time period coincides with herring and yellow and white perch spawning. As far as juvenile habitat for most resident species and early migratory species, that general area does not seem to hold significant suitable habitat. It's already pretty well degraded.

 <p>CHANGING Maryland for the Better</p>  <p>dnr.maryland.gov</p>	<p>Paul Piavis Program Manager Fishing and Boating Services Department of Natural Resources 301 Marine Academy Dr. Stevensville, MD 21666 410-643-6776 xtn 2110 (office)</p> <p>paul.piavis@maryland.gov</p>
--	--

[Click here](#) to complete a three question customer experience survey.

On Tue, Mar 28, 2017 at 2:51 PM, Amanda Gould <agould@straughanenvironmental.com> wrote:

Mr. Piavis,

I am following up on John Mullican's email below regarding freshwater fisheries located near the Hanover Street Bridge Improvement Project.

In the email below, John stated that you would be able to provide additional comments pertaining to resident species in and near the project area. Could you provide any comments that you may have regarding resident fish species that would be impacted by this project?

Thank you for your time and any additional information you can provide.

Amanda Gould (Deering)



From: Kristy Beard - NOAA Federal [<mailto:kristy.beard@noaa.gov>]
Sent: Monday, July 25, 2016 12:24 PM
To: Amanda Deering
Subject: Hanover Street Bridge: response to info request

Dear Ms. Deering:

We have reviewed the information you provided to us regarding the Hanover Street Bridge. We offer the following preliminary comments pursuant to the Endangered Species Act, the Fish and Wildlife Coordination Act, and the Magnuson-Stevens Fishery Conservation and Management Act:

Endangered Species Act

If you haven't already, please contact Brian Hopper of our Protected Resources Division on endangered species. He can be reached at brian.d.hopper@noaa.gov or 410-573-4592.

Fish and Wildlife Coordination Act

The Patapsco River provides habitat for a variety of NOAA trust resources such as anadromous fish. In particular, the area surrounding the Hanover Street Bridge is mapped as white perch spawning habitat. Efforts should be made to avoid and minimize adverse effects to the aquatic environment. Best management practices should be used to minimize the release of suspended sediment in the waterway and acoustic impacts to fish in the area. Depending on what in-water work is planned, time of year restrictions (February 15 through June 15) may be necessary during anadromous fish spawning in the area.

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat

Essential Fish Habitat (EFH) has been designated within the project area. Further EFH consultation by the federal action agency may be required as part of the federal permit process. For a listing of EFH and further information, please go to our website at: <http://www.greateratlantic.fisheries.noaa.gov/habitat>. The website also contains information on descriptions of EFH for each species, guidance on the EFH consultation process including EFH assessments, and information relevant to other NMFS mandates. If you wish to discuss this further, please e-mail Kristy.Beard@noaa.gov or call 410-573-4542.

Thanks!

Kristy

--

*Kristy Beard
 Marine Habitat Resource Specialist
 Habitat Conservation Division*

*NOAA Fisheries
 177 Admiral Cochrane Drive
 Annapolis, MD 21401
 410-573-4542*

<http://www.nmfs.noaa.gov/>





APPENDIX B

EXISTING MARKET DYNAMICS ANALYSIS





Demographics

Populations and Households

Studying the existing market dynamics of an area begins with examining the demographics, including population and household growth. A growing population can indicate the need for new services. As of 2015, the population of the Study Area was 32,968, and the population of the City of Baltimore was 620,218 (see **Table B. 1**). Both populations are expected to grow. The Study Area's population is projected to reach 33,535 by 2020, and Baltimore City's population is projected to reach 622,015 by 2020. The Baltimore-Columbia-Towson MSA had a population of 2,778,512 in 2015 and is projected to grow by 3.0 percent to 2,863,225 people by 2020.

Table B. 1: Population and Growth of Economic Study Area and Surrounding Areas

Geography	Population			Change, 2010 to 2015			Change, 2015 to 2020		
	2010	2015	2020	#	%	CAGR	#	%	CAGR
Study Area	32,197	32,968	33,535	771	2.4%	0.2%	567	1.7%	0.2%
<i>Share of MSA</i>	1.2%	1.2%	1.2%						
Baltimore	620,961	620,218	622,015	(743)	-0.1%	0.0%	1,797	0.3%	0.0%
<i>Share of MSA</i>	22.9%	22.3%	21.7%						
MSA	2,710,489	2,778,512	2,863,225	68,023	2.5%	0.2%	84,713	3.0%	0.3%

¹ CAGR refers to Compound Annual Growth Rate

Source: ESRI; AECOM, April 2016.

Table B. 2: Population and Growth of Economic Study Area and Regions

Geography	Population			Change, 2010 to 2015			Change, 2015 to 2020		
	2010	2015	2020	#	%	CAGR	#	%	CAGR
South	18,544	18,457	18,422	(87)	-0.5%	0.0%	(35)	-0.2%	0.0%
<i>Share of Study Area</i>	57.6%	56.0%	54.9%						
West	1,665	1,625	1,603	(40)	-2.4%	-0.2%	(22)	-1.4%	-0.1%
<i>Share of Study Area</i>	5.2%	4.9%	4.8%						
East	11,988	12,886	13,510	898	7.5%	0.7%	624	4.8%	0.5%
<i>Share of Study Area</i>	37.2%	39.1%	40.3%						
Study Area	32,197	32,968	33,535	771	2.4%	0.2%	567	1.7%	0.2%

¹ CAGR refers to Compound Annual Growth Rate

Source: ESRI; AECOM, April 2016.





The age profile of an area can indicate the types of development and services needed, as well as give an indication of how a population's needs might change. Overall, the Study Area has a younger population than the City as a whole. In 2015, the median age of the Study Area was 32 years old versus 35.3 in Baltimore.

Population pyramids show the largest age group in the Study Area is 25 to 29 years old followed by the 30 to 34 years old and 20 to 24 years old groups. By 2020, the Study Area's population pyramid projects the largest age group to remain at 25 to 29 years old followed by 30 to 34 years old and 35 to 39 years. Similar to the Study Area, the City of Baltimore's largest age group is 25 to 29 years old with the 20 to 24 years old age group following closely behind. All three of these age groups are considered to be prime "workforce" age, and in the Study Area, the ages 20 to 29 are typically ages of new household formation and transition which can have unique housing demands.

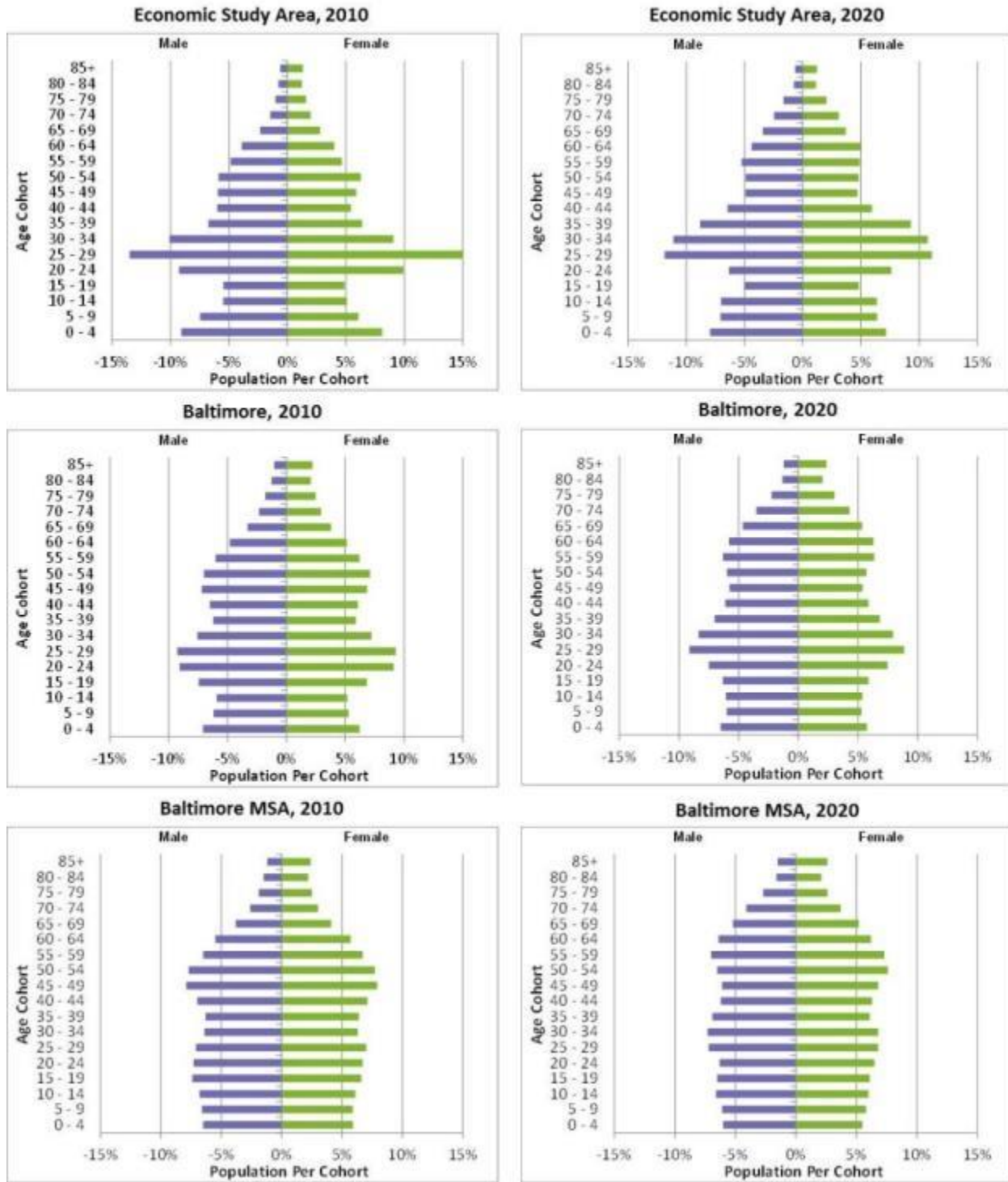
Unlike the Study Area, Baltimore City's population is more evenly distributed among age groups, which can be seen in **Figure B. 1**. One of the possible reasons the 25 to 29 years old group is expected to remain the largest is the presence of major universities in Baltimore City. The City of Baltimore is home to the following colleges and universities: Coppin State University, Morgan State University, University of Baltimore, University of Maryland, Baltimore, Johns Hopkins University, Loyola University, Maryland Institute College of Art, Notre Dame of Maryland University, and Sojourner-Douglass College.

In addition to having an overall younger population, the area has a greater concentration of population aged under 10 years than the City and MSA (15 percent versus approximately 12 percent in the comparative geographies) and a lesser concentration of those aged 65 and older (8.9 percent versus 13.3 percent in Baltimore and 14.7 percent in the MSA). The Baltimore MSA trends older with a median age of 38.9 years old and the largest age group being 45 to 49 years old.





Figure B. 1: Population Age Pyramids, 2010 and 2020



Source: ESRI; AECOM, 2016





Households form the basic consumer unit for housing and retail, and so growth in households can indicate support for additional space for these land uses. As seen in **Table B. 3**, in 2015, the Study Area had 13,685 households, and by 2020 is anticipated to grow by 2.1 percent to 13,972 households. In 2015, Baltimore City had 251,433 households, and is projected to add 1,152 households by 2020, a growth of 0.5 percent over the time period.

Both the Study Area and City of Baltimore have an average household size of 2.4 people. Within the Study Area, the south region has the most households with 50 percent of all Study Area households in 2015. The west region has the fewest number of households within the Study Area with only 4.2 percent of all Study Area households in 2015. The east region of the Study Area has grown the most with an 8.6 percent increase in households from 2010 to 2015 and 45.8 percent of all Study Area households in 2015. While the south region still has the most households within the Study Area, the population and number of households in the region have been in decline. From 2010 to 2015, the south region has seen a decrease in households by 0.5 percent, and is expected to decrease by another 0.3 percent by 2020.

Table B. 3: Households and Growth in Economic Study Area and Surrounding Areas

Geography	Households			Change, 2010 to 2015			Change, 2015 to 2020		
	2010	2015	2020	#	%	CAGR	#	%	CAGR
Study Area	13,232	13,685	13,972	453	3.4%	0.3%	287	2.1%	0.2%
<i>Share of MSA</i>	<i>1.3%</i>	<i>1.3%</i>	<i>1.3%</i>						
Baltimore	249,903	251,433	252,585	1,530	0.6%	0.1%	1,152	0.5%	0.0%
<i>Share of MSA</i>	<i>24.1%</i>	<i>23.6%</i>	<i>23.0%</i>						
MSA	1,038,765	1,066,875	1,099,924	28,110	2.7%	0.3%	33,049	3.1%	0.3%

¹CAGR refers to Compound Annual Growth Rate

Source: ESRI; AECOM, April 2016.

Table B. 4: Households and Growth of Economic Study Area and Regions

Geography	Households			Change, 2010 to 2015			Change, 2015 to 2020		
	2010	2015	2020	#	%	CAGR	#	%	CAGR
South	6,877	6,842	6,819	(35)	-0.5%	-0.1%	(23)	-0.3%	0.0%
<i>Share of Study Area</i>	<i>52.0%</i>	<i>50.0%</i>	<i>48.8%</i>						
West	578	569	563	(9)	-1.6%	-0.2%	(6)	-1.1%	-0.1%
<i>Share of Study Area</i>	<i>4.4%</i>	<i>4.2%</i>	<i>4.0%</i>						
East	5,777	6,274	6,591	497	8.6%	0.8%	317	5.1%	0.5%
<i>Share of Study Area</i>	<i>43.7%</i>	<i>45.8%</i>	<i>47.2%</i>						
Study Area	13,232	13,685	13,972	453	3.4%	0.3%	287	2.1%	0.2%

¹CAGR refers to Compound Annual Growth Rate

Source: ESRI; AECOM, April 2016.





Housing Units

There are over 15,000 dwelling units within the 7.9-square mile Study Area. The Study Area accounts for 5.2 percent of all City of Baltimore dwelling units. As shown in **Table B. 5**, 87.2 percent of all dwelling units in the Study Area are occupied compared to 83.4 percent of the City of Baltimore's dwelling units and 91.4 percent of all MSA dwelling units.

In the Study Area, more dwelling units are rented than owned. In fact, 50.7 percent of all Study Area dwelling units are rented compared to 45.9 percent in Baltimore City and 32.4 percent in the MSA.

Table B. 5: Housing Units by Occupancy Status and Tenure of Economic Study Area and Surrounding Areas

Housing Units by Occupancy Status and Tenure, 2015						
Occupancy Status and Tenure	Study Area		Baltimore		MSA	
	#	%	#	%	#	%
Total Housing Units	15,685	100.0%	301,471	100.0%	1,167,062	100.0%
Occupied	13,685	87.2%	251,433	83.4%	1,066,875	91.4%
Owner	5,729	36.5%	112,966	37.5%	688,549	59.0%
Renter	7,956	50.7%	138,467	45.9%	378,326	32.4%
Vacant	2,000	12.8%	50,038	16.6%	100,187	8.6%

Source: ESRI; AECOM, 2016.

When observing housing occupancy and tenure within the Study Area, there is a divide between regions. A majority of dwelling units are occupied among the three regions: 86.2 percent occupancy in the south region, 77.7 percent occupancy in the west region, and 89.5 percent occupancy in the east region. The divide is more apparent in tenure. In the south region, 64.2 percent of all dwelling units are rented, whereas almost half of that figure – 35.8 percent – are rented in the east region. The amount of owned units in the Study Area is highest in the east region with 53.7 percent. The south and west regions have owned dwelling unit shares of 21.9 percent and 30.6 percent respectively.

Table B. 6: Housing Units by Occupancy Status and Tenure of Economic Study Area and Its Regions

Housing Units by Occupancy Status and Tenure, 2015								
Occupancy Status and Tenure	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
Total Housing Units	7,940	100.0%	732	100.0%	7,013	100.0%	15,685	100.0%
Occupied	6,842	86.2%	569	77.7%	6,274	89.5%	13,685	87.2%
Owner	1,742	21.9%	224	30.6%	3,763	53.7%	5,729	36.5%
Renter	5,100	64.2%	345	47.1%	2,511	35.8%	7,956	50.7%
Vacant	1,098	13.8%	163	22.3%	739	10.5%	2,000	12.8%

Source: ESRI; AECOM, 2016.

Table B. 7 shows the types of dwelling units in the Study Area, City of Baltimore, and the Baltimore MSA. The most common type of housing unit in the Baltimore MSA is a single family detached unit. However, in the City of Baltimore, 52.8 percent of all housing units are single family attached units. Much like the City, the Study Area's most common housing unit type is a single family attached unit representing 73.6 percent of all units.





Table B. 7: Housing Units by Units in Structure of Economic Study Area and Surrounding Areas

Housing Units by Units in Structure, 2015						
Units in Structure	Study Area		Baltimore		MSA	
	#	%	#	%	#	%
Total	14,848	100.0%	296,256	100.0%	1,135,798	100.0%
1, detached	1,052	7.1%	43,067	14.5%	516,577	45.5%
1, attached	10,933	73.6%	156,498	52.8%	327,178	28.8%
2	864	5.8%	15,578	5.3%	24,313	2.1%
3 or 4	447	3.0%	16,924	5.7%	29,362	2.6%
5 to 9	543	3.7%	16,792	5.7%	55,591	4.9%
10 to 19	340	2.3%	13,196	4.5%	92,765	8.2%
20 to 49	116	0.8%	7,084	2.4%	21,153	1.9%
50 or more	539	3.6%	26,472	8.9%	54,708	4.8%
Mobile home	15	0.1%	435	0.1%	13,667	1.2%
Boat, RV, van, etc.	0	0.0%	210	0.1%	484	0.0%

Source: ESRI; AECOM, 2016.

Within the Study Area, single family attached units are the most common type of housing units. 67.6 percent of all housing units in the south region are single family attached. 81.4 percent of housing units in the west region are single family attached, and 80.4 percent of housing units in the east region are single family attached units (See **Table B. 8**). There is barely a presence of high-density structures in the south and west regions: 0.8 percent of all structures in the south and 0.1 percent in the west have 50 or more units. In the east region, 7.7 percent of housing structures are higher-density having 50 or more units. While this percentage as a whole of the region itself is not high, it is much higher than its surrounding regions.

Table B. 8: Housing Units by Units in Structure of Economic Study Area and Its Regions

Housing Units by Units in Structure, 2015								
Units in Structure	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
Total	7,922	100.0%	720	100.0%	6,206	100.0%	14,848	100.0%
1, detached	780	9.8%	77	10.7%	194	3.1%	1,052	7.1%
1, attached	5,358	67.6%	586	81.4%	4,989	80.4%	10,933	73.6%
2	647	8.2%	26	3.6%	191	3.1%	864	5.8%
3 or 4	307	3.9%	0	0.0%	139	2.2%	447	3.0%
5 to 9	509	6.4%	4	0.6%	31	0.5%	543	3.7%
10 to 19	247	3.1%	10	1.4%	82	1.3%	340	2.3%
20 to 49	7	0.1%	16	2.2%	92	1.5%	116	0.8%
50 or more	62	0.8%	1	0.1%	476	7.7%	539	3.6%
Mobile home	4	0.1%	0	0.0%	11	0.2%	15	0.1%
Boat, RV, van, etc.	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source: ESRI; AECOM, 2016.

Household Income and Access to Privately-Owned Vehicles

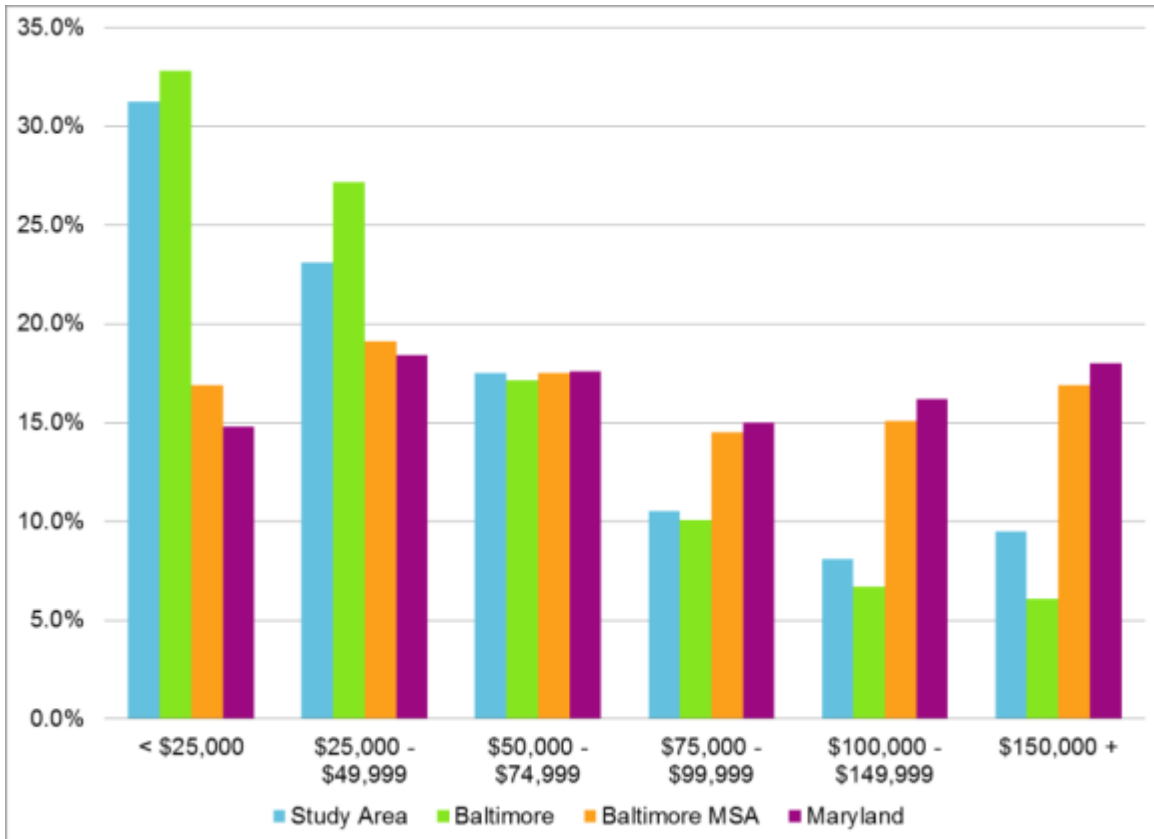
Nearly one-third – 31.3 percent – of households in the Study Area earn less than \$25,000 a year. Nearly a quarter – 23.1 percent – of all households in the study area earn between \$25,000 and \$49,999.





Similarly, these are the two largest income brackets in the City of Baltimore with 32.8 percent and 27.2 percent respectively. Income is more evenly distributed in the MSA with 19.1 percent earning between \$25,000 and \$49,000. The second largest income bracket in the MSA is \$50,000 to \$74,999 with 17.5 percent of all households.

Figure B. 2: Comparison of Share of Households by Household Income in Economic Study Area and Surrounding Areas, 2015



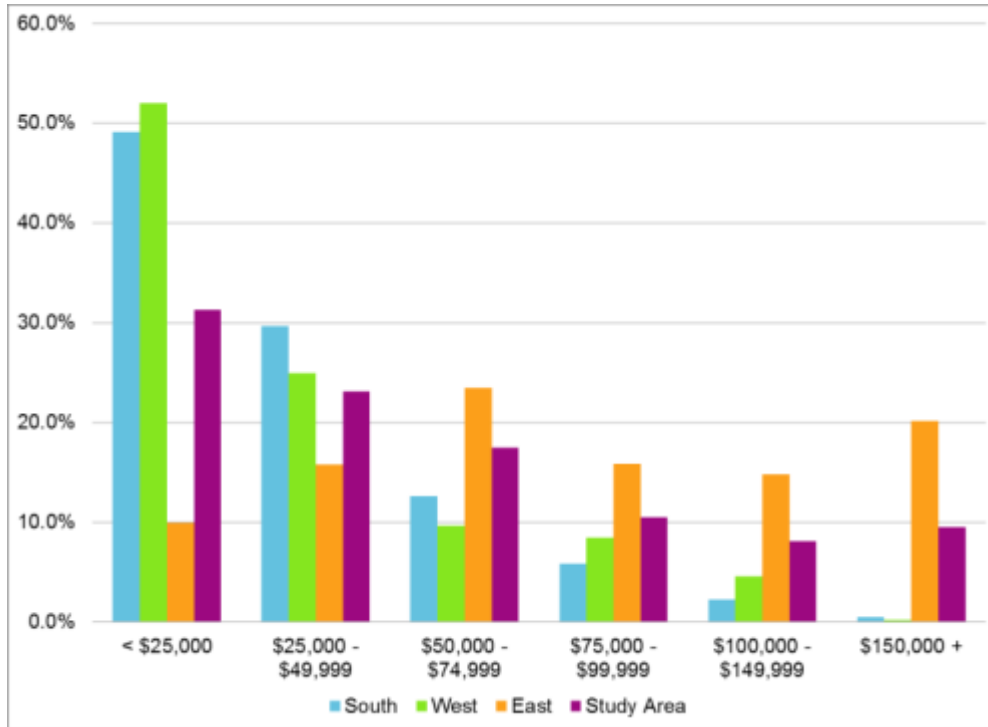
Source: ESRI; AECOM, 2016

Household income in the Study Area is higher than the City of Baltimore but less than the Baltimore MSA. Median household income for the Study Area was \$43,991 in 2015. Baltimore City and the MSA’s median household incomes in 2015 were \$39,306 and \$68,363 respectively. While the Study Area’s median household income is not the lowest in the region, the median household income within the Study Area varies greatly, and some regions of the Study Area earn significantly less than others. In 2015, median household income for the south, west, and east regions of the Study Area were \$25,457, \$23,404, and \$75,890 respectively. **Figure B. 3** shows the disparity within the Study Area by comparing household income brackets by Study Area regions. As the household income increases, the share of households in those brackets decreases drastically for south and west regions, and the opposite occurs for east regions.





Figure B. 3: Comparison of Share of Households by Household Income Economic Study Area and Its Regions, 2015



Source: ESRI; AECOM, 2016

The number of vehicles available per household can indicate access to services, general mobility, and presence of disposable income. While this indicator is less significant in an urban location—where transit is more prevalent—because of the multimodal transportation focus of the Hanover Street Corridor study, it is relevant. Households with no vehicles also tend to be more multimodal than households with several vehicles available. The data shows 28.1 percent of households in the Study Area own no vehicles and 30.3 percent of households in the City of Baltimore own no vehicles.

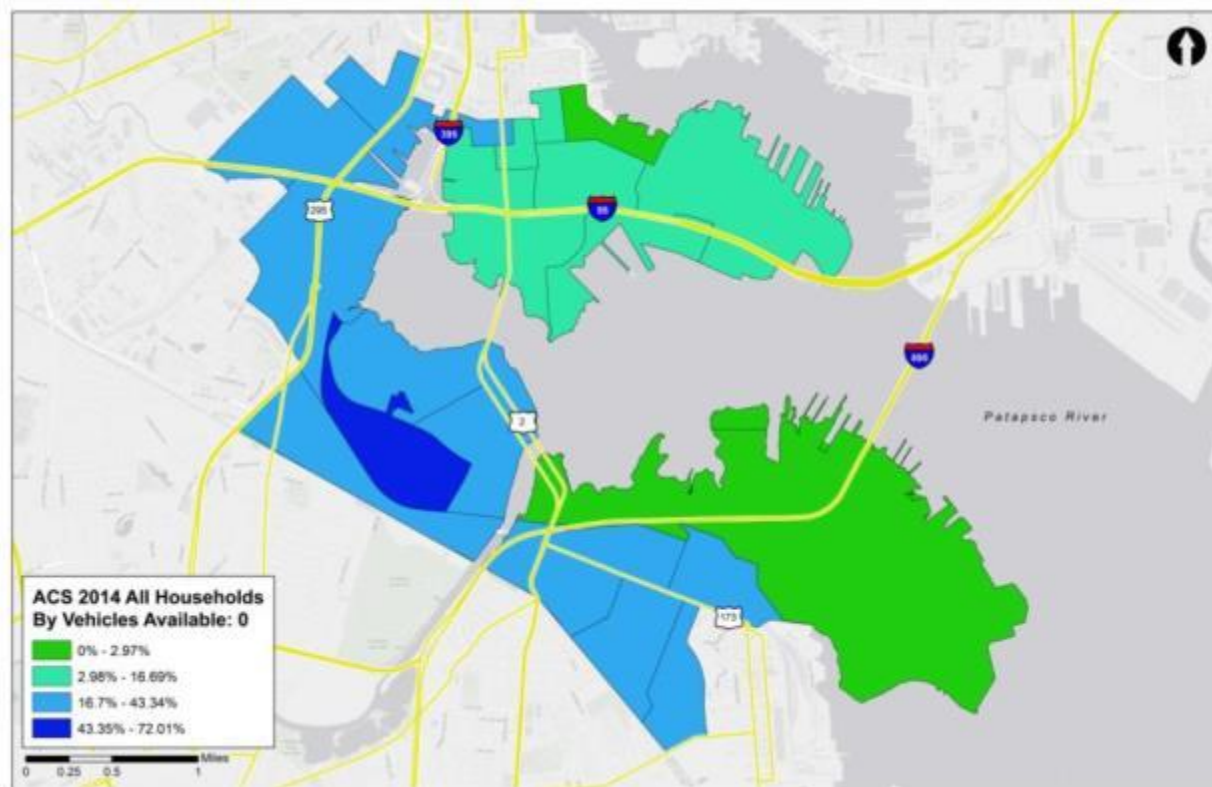
Unsurprisingly, the differences in income in study area regions are reflected in vehicle ownership. The south region of the Study Area has 44.7 percent of households without access to a vehicle while the east region only has 8.6 percent of households without vehicles. Alternatively, 40.5 percent of east region households own two vehicles whereas only 12.9 percent of south region households own two vehicles.

Figure B. 4 is a map of how many households own no vehicles by census tract. It shows that, in a census tract in the south region of the Study Area, 72 percent of households have no vehicles available. This is important to note considering 54.7 percent of the Study Area households and 56.7 percent of the Study Area population is located in the south region; in other words, the most heavily-populated region of the Study Area has the highest share of households without access to a vehicle and thus has a higher reliance on transit.





Figure B. 4: Percent of Households Owning No Vehicles by Census Tract



Source: ESRI; AECOM, 2016

While it may appear as if half of the south region has no households without any vehicles, there are only 41 households and 76 people in the entire Fairfield Area as of the 2009-2013 ACS. Referring back to **Figure 3-1**, the base map shows the Fairfield Area to be the same as the green census tract in the south region in **Figure B. 4**. The other census tracts in the south region have anywhere from 16.7 percent to 72.0 percent of households owning no vehicles. Census tracts in the west region have anywhere from 16.7 to 43.3 percent of households without access to a vehicle.



Household Spending

Households in the Study Area spent over \$630 million on goods and services in 2015. **Table B. 9** shows this spending averages out to \$46,091 per household. South region households spent over \$164 million, west region households spent over \$14 million, and east region households spent over \$449 million on goods and services.

Table B. 9: Household Goods and Services Expenditures by Economic Study Area and Its Regions, 2015

Household Expenditures, 2015		
Region	Total Spent	Average Per Household
South	\$164,273,786	\$24,010
West	\$14,488,301	\$25,463
East	\$449,151,757	\$71,589
Study Area	\$630,756,507	\$46,091

Source: ESRI; AECOM, 2016.

Food spending accounts for 16.5 percent of south region household total spending, 16.1 percent of west region households' total spending, and 16.3 percent of east region households' retail goods and services expenditures. Most of these expenditures are for food at home (see **Table B. 10**). Households in the south region spend almost \$4,000 annually on all food expenditures. West region households spend \$4,094. East region households spend almost three times as much on food as south and west region households do. In addition, east region households spend more than three times the amount south and west region households do on food away from home, alcoholic beverages, and nonalcoholic beverages at home. While east region households outspend west and south region households in every category of retail goods and services expenditures, it is important to note the presence of a "food desert" in the south region. This most likely affects the amount spent on food by households in this region. The concept of "food deserts" and this existing condition will be explained in more detail later on in this report.

Table B. 10: Average annual Household Food Spending by Economic Study area and Its Regions, 2015

Average Annual Household Food Spending, 2015				
Type of Food Expenditures	South	West	East	Study Area
Total Food Expenditures	\$3,957	\$4,094	\$11,669	\$7,551
Food at Home	\$2,477	\$2,583	\$6,997	\$4,638
Food Away from Home	\$1,480	\$1,512	\$4,672	\$2,913
Alcoholic Beverages	\$249	\$250	\$874	\$516
Nonalcoholic Beverages at Home	\$243	\$256	\$670	\$450

Source: ESRI; AECOM, 2016.

Educational Attainment

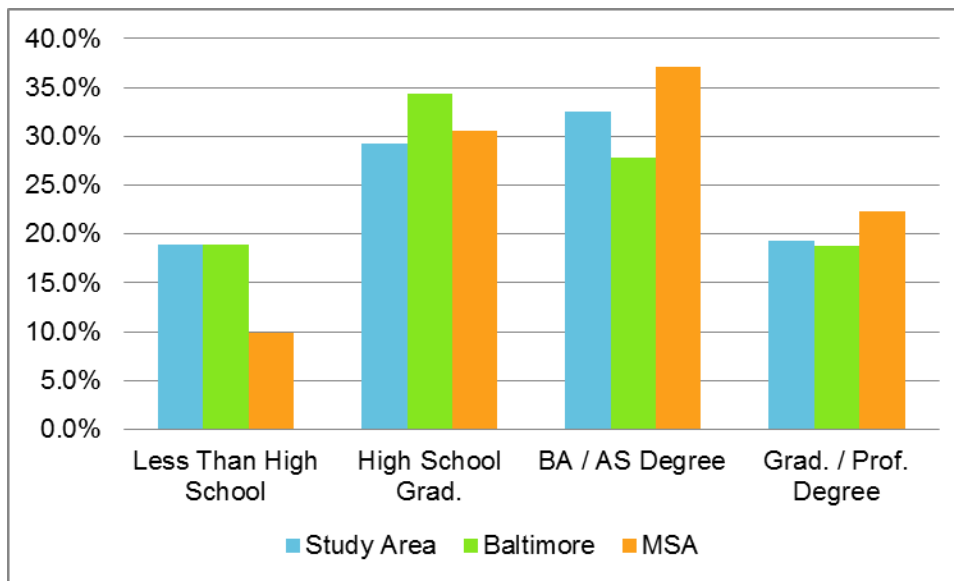
Educational attainment can indicate workforce readiness for various types of industries and also tends to reflect the economic potential of households in the area. Overall, educational attainment in the Study





Area is higher than Baltimore City (See **Figure B. 5**). The population aged 25 years and older has a greater share of bachelors, associates, and graduate and professional degrees than the City of Baltimore. Alternatively, Baltimore City has a higher share of people with high school diplomas and about the same share of people without a high school diploma. In the Study Area, 32.5 percent of people aged 25 and older have a bachelors or associates degree and 19.3 have a graduate or professional degree. In the City of Baltimore, the share of people aged 25 and older with a bachelors or associates degree is 27.8 percent. 18.8 percent of the same population in Baltimore City has a graduate or professional degree. While the Study Area has a slightly higher educational attainment than the City of Baltimore, it falls behind the MSA’s educational attainment. 37.2 percent of the population aged 25 and older in the MSA has a bachelors or associates degree and 22.4 percent has a graduate or professional degree.

Figure B. 5: Educational Attainment Comparison, 2015



Source: ESRI; AECOM, 2016

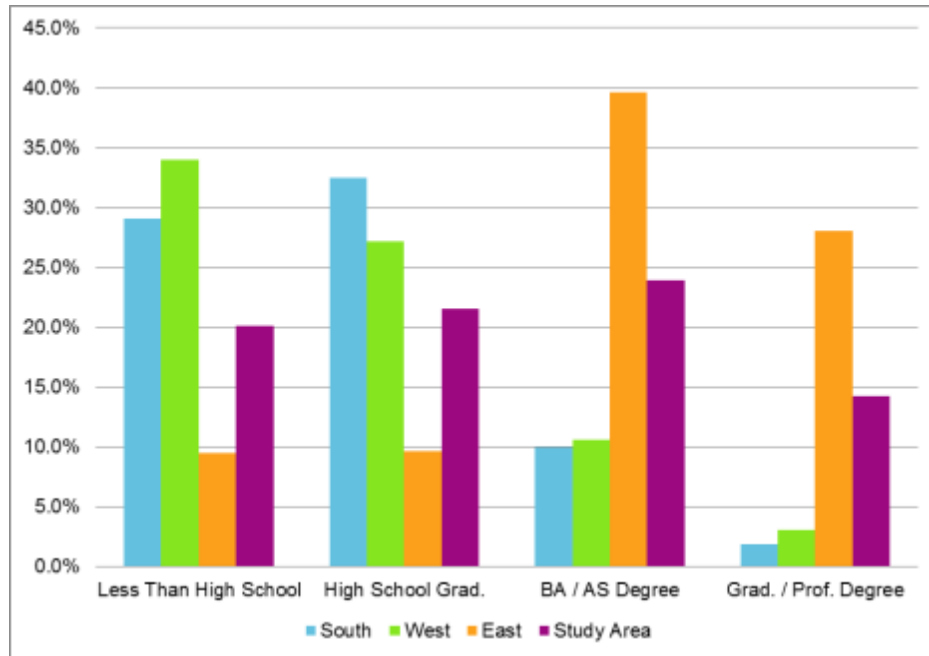
While the Economic Study Area’s educational attainment is slightly higher than the City of Baltimore’s, there is disparity within the Study Area itself. **Figure B. 6** shows the comparison of educational attainment within the Study Area. The south and west regions have significantly higher shares of people with a high school diploma or no high school education than the east region. Consequently, the east region has a much larger share of people with bachelors, associates, and graduate or professional degrees than the west or south regions. The east region of the Study Area is so highly educated, its shares of people with bachelors, associates, and graduate or professional degrees is much higher than the average of the entire Study Area. In the south region, 29.1 percent and, in the west region, 33.9 percent of populations aged 25 and older have less than a high school education whereas only 9.5 percent of the same population in the east region has less than a high school level education. In the east region, 39.6 percent of the 25 and older population has a bachelors or associates degree in comparison to the south and west regions, which only have 10.0 and 10.6 percent of the same populations with a





bachelors or associates respectively. Only 1.9 percent of the 25 and older population in the south region have a graduate or professional degree. In comparison, 28.0 percent of the 25 and older population in the east region have a graduate or professional degree.

Figure B. 6: Educational Attainment Comparison by Economic Study Area Region, 2015



Source: ESRI; AECOM, 2016

Employment and Industries

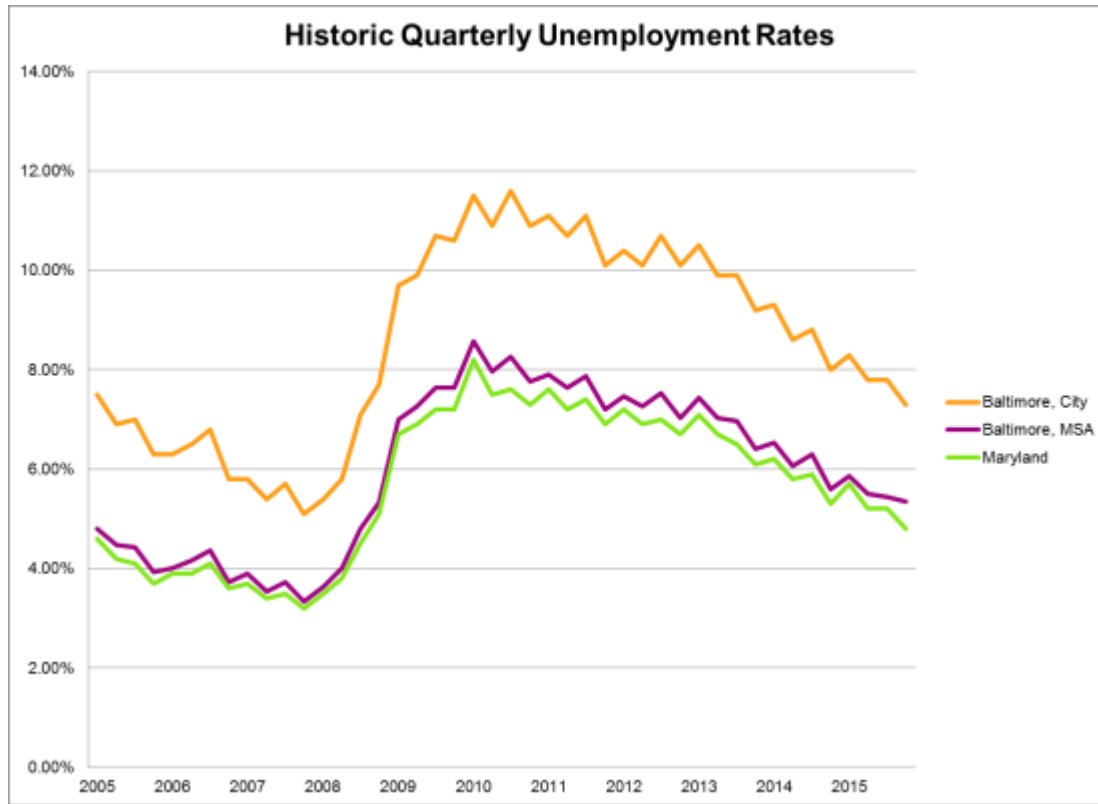
Labor Force and Unemployment

Figure B. 7 shows historical quarterly unemployment rates of the City of Baltimore, the Baltimore MSA, and the State of Maryland. Baltimore City, the MSA, and the State of Maryland have had similar unemployment trends. Despite having similar trends, the City of Baltimore has always had significantly higher unemployment rates than the MSA or the state. At the trough, or lowest point of the unemployment cycle, Baltimore City had a 5.1 percent unemployment rate. This was in Q4 of 2008. At the same time, the MSA and the state had unemployment rates of 3.3 percent and 3.2 percent respectively. At the peak of unemployment, or the highest point, Baltimore City had 11.6 percent unemployment, which was in Q3 of 2010. The peaks for the MSA and state were 8.6 in Q1 2010 and 8.2 in Q1 2010 respectively. While all three jurisdictions are experiencing a decline in unemployment, the City of Baltimore still has a much higher unemployment rate than the MSA or state. As of Q4 2015, Baltimore, the MSA and the state had unemployment rates of 7.3 percent, 5.35 percent, and 4.8 percent respectively.





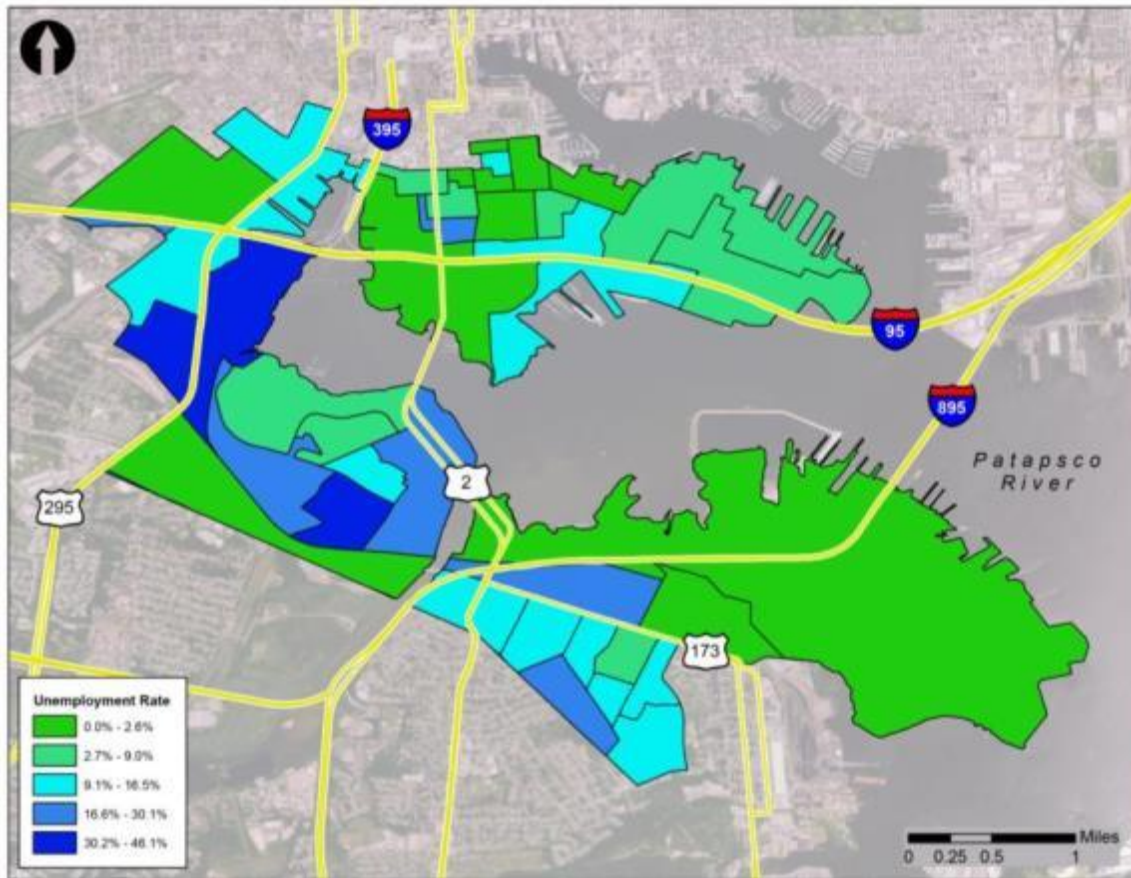
Figure B. 7: Historic Unemployment Rate Comparison



The unemployment rate of work force living in the Economic Study Area differs from the area overall. The south area has an unemployment rate of 17.5 percent, compared to only 5.7 percent in the east area. This is illustrated by census tract in **Figure B. 8**.



Figure B. 8: Map of Unemployment by Census Tract



Source: U.S. Census Bureau; ESRI; AECOM, 2016

Table B. 11: Unemployment Rate Comparison of Economic Study Area and Its Regions, 2015

	Unemployment Rate, 2015		
	Unemployed	Labor Force	Rate
South	2,423	13,861	17.5%
West	789	4,669	16.9%
East	581	10,139	5.7%
Study Area	3,793	28,669	13.2%

Source: US Census Bureau; AECOM 2016.

Employment by Industry

Baltimore is known for its industrial-dominated economy with its presence of manufacturing, warehousing, transportation, and other similar activities and employment types. While industrial production and manufacturing are known to dominate the Baltimore economy, they are not the only industries with high concentrations of employments in the City. In fact, the industry with the highest share of employees is health care (See **Table B. 12**). The second largest industry in terms of employment





in Baltimore City is educational services with 14.8 percent. The top two industries are no surprise given the significant presence of hospitals, medical facilities, and universities within the City.

Within the Economic Study Area, 26.0 percent of employees work in transportation and warehousing. Only 4.4 percent of Baltimore City employees and 3.2 percent of MSA employees work in this industry. The second and third largest industries for employment in the Economic Study Area are manufacturing and health care with 11.7 percent and 9.2 percent respectively. In the MSA, health care, retail trade and education services are the top three industries for employment with 15.2 percent, 10.9 percent, and 10.6 percent respectively.

Table B. 12: Shares of At Place Employment by Industry in the Economic Study area and Surrounding Areas, 2014

Shares of Employment By Industry, 2014			
Industry	Study Area	Baltimore	MSA
Agriculture, Forestry, Fishing and Hunting	0.0%	0.0%	0.2%
Mining, Quarrying, and Oil and Gas Extraction	0.0%	0.0%	0.0%
Utilities	0.2%	0.8%	0.4%
Construction	5.2%	2.8%	5.5%
Manufacturing	11.7%	3.5%	4.4%
Wholesale Trade	9.3%	2.5%	4.1%
Retail Trade	7.0%	4.8%	10.9%
Transportation and Warehousing	26.0%	4.4%	3.2%
Information	2.5%	1.4%	1.6%
Finance and Insurance	0.6%	3.6%	4.0%
Real Estate and Rental and Leasing	1.3%	1.5%	1.7%
Professional, Scientific, and Technical Services	6.0%	6.4%	9.5%
Management of Companies and Enterprises	2.8%	0.7%	1.1%
Administration & Support, Waste Management and Remediation	5.8%	6.9%	6.7%
Educational Services	3.2%	14.8%	10.6%
Health Care and Social Assistance	9.2%	21.0%	15.2%
Arts, Entertainment, and Recreation	0.9%	1.6%	1.8%
Accommodation and Food Services	3.9%	6.7%	8.1%
Other Services (excluding Public Administration)	4.2%	3.1%	3.4%
Public Administration	0.1%	13.5%	7.5%

Source: US Census Bureau; AECOM, 2016.

Because the Economic Study Area's largest employment industry – transportation and warehousing – has a share of employment more than five times higher than Baltimore City and the MSA, it is important to observe the concentrations of employment within the Economic Study Area regions. **Table B. 13** shows the share of employment by industry within each region.

The south region's top three employment industries are transportation and warehousing, health care, and administration and support waste management and remediation with 33.2 percent, 18.7 percent and 8.8 percent respectively. The west region's top three employment industries are manufacturing, wholesale trade, and construction with 31.3 percent, 25.3 percent, and 13.1 percent respectively. The





east region's top three employment industries are transportation and warehousing, manufacturing, and retail trade with 27.3 percent, 9.3 percent, and 8.7 percent respectively. There is no agriculture or mining employment anywhere in the Economic Study Area.

Table B. 13: Shares of At Place Employment by Industry in Economic Study Area and Its Regions, 2014

Shares of Employment By Industry, 2014				
Industry	South	West	East	Study Area
Agriculture, Forestry, Fishing and Hunting	0.0%	0.0%	0.0%	0.0%
Mining, Quarrying, and Oil and Gas Extraction	0.0%	0.0%	0.0%	0.0%
Utilities	0.0%	0.8%	0.1%	0.2%
Construction	3.6%	13.1%	4.2%	5.2%
Manufacturing	7.2%	31.3%	9.3%	11.7%
Wholesale Trade	8.6%	25.3%	4.7%	9.3%
Retail Trade	4.2%	9.5%	8.7%	7.0%
Transportation and Warehousing	33.2%	2.6%	27.3%	26.0%
Information	0.0%	0.0%	5.5%	2.5%
Finance and Insurance	0.6%	0.1%	0.6%	0.6%
Real Estate and Rental and Leasing	2.1%	1.4%	0.6%	1.3%
Professional, Scientific, and Technical Services	4.7%	1.3%	8.6%	6.0%
Management of Companies and Enterprises	0.0%	1.4%	5.8%	2.8%
Administration & Support, Waste Management and Remediation	8.8%	0.9%	4.8%	5.8%
Educational Services	3.8%	2.3%	2.9%	3.2%
Health Care and Social Assistance	18.7%	1.8%	3.1%	9.2%
Arts, Entertainment, and Recreation	0.0%	0.1%	2.0%	0.9%
Accommodation and Food Services	2.4%	2.0%	5.9%	3.9%
Other Services (excluding Public Administration)	1.8%	6.3%	5.7%	4.2%
Public Administration	0.1%	0.0%	0.1%	0.1%

Source: US Census Bureau; AECOM, 2016.

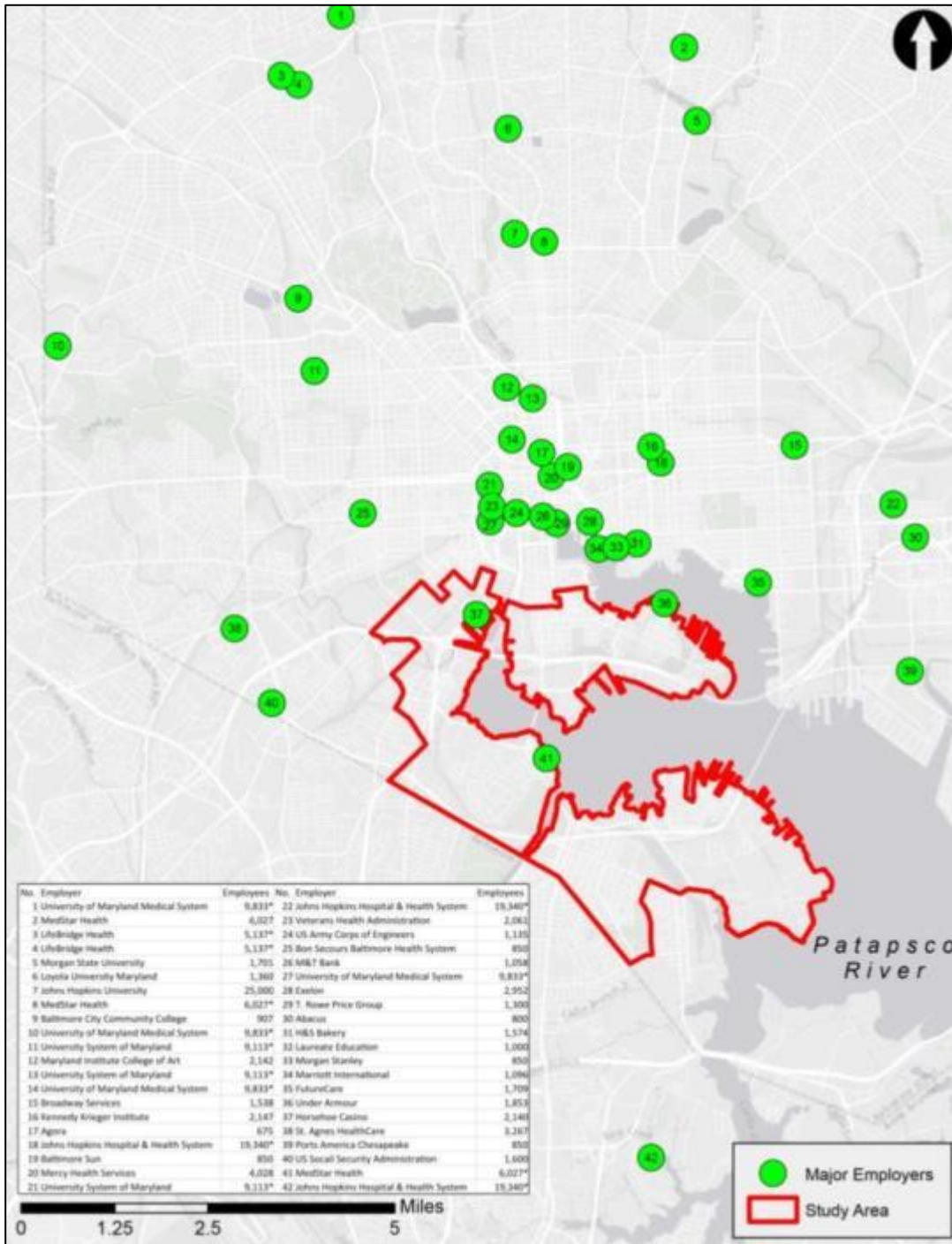
Major Employers

The Baltimore Department of Commerce published a list of Baltimore's major employers. This list contained the name of the employer, the industry type, and the amount of employees. **Figure B. 9** maps out the top 32 employers and shows the amount of employees each employer has. The map shows 42 employers because five of the 32 employers have multiple locations and each location has been represented. Of the top 32 employers in Baltimore, three fall in the Economic Study Area: MedStar Health, Horseshoe Casino, and Under Armour. Together, these three entities employ 10,020 people. The City of Baltimore's top 3 employers are Johns Hopkins University, Johns Hopkins Hospital and Health System, and the University System of Maryland with over 9,000 employees each.





Figure B. 9: Baltimore's Major Employers



*Denotes employer with multiple locations; each location shows total employment figure not location employment.
Source: Baltimore Department of Commerce; ESRI; AECOM, 2016





Resident Employment by Industry

In addition to the employment by industry within the Economic Study Area, the study also includes the industries in which Economic Study Area residents are employed. There is a disconnect between the predominant industries of the businesses in the Economic Study Area and the industries in which residents are employed. The major employment industries of south region residents are health care and social assistance; retail trade; administration and support, waste management and remediation; and accommodation and food services. The health care and social services industry accounts for 16.8 percent of south region residents' employment. In the south region, 13.9 percent work in retail trade, 10.6 percent work in administration and support and waste management and remediation, and 9.8 percent work in accommodation and food services. These four industries account for 51.1 percent of all south region residents' employment. These figures can be seen in **Figure B. 10**.

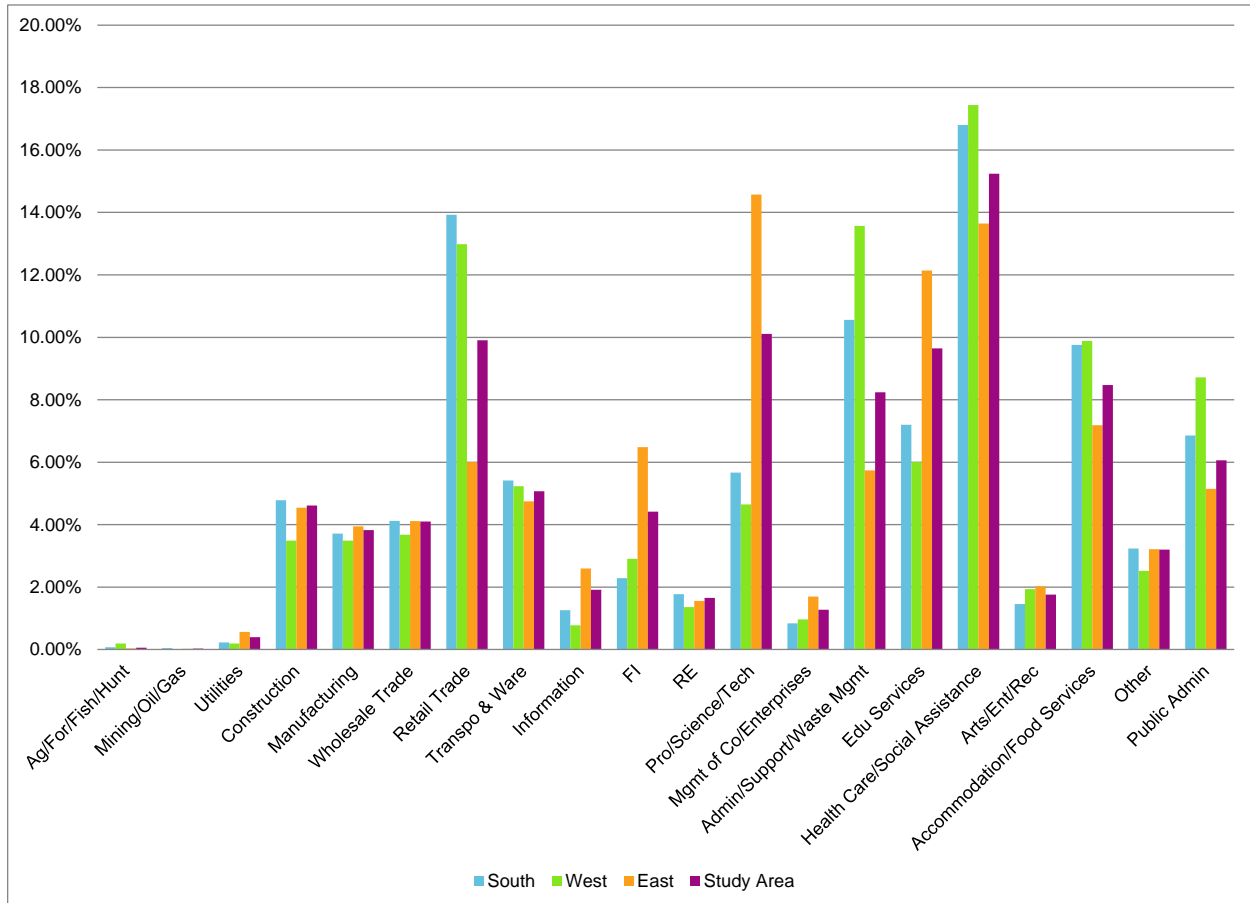
Similar to south region residents, the top employment industries of residents in the west region are: health care and social assistance; administration and support, waste management and remediation; retail trade; and accommodation and food services. The health care and social assistance industry accounts for 17.4 percent of all west region residents' employment. In the west region, 13.6 percent of west region residents have administration and support, waste management and remediation jobs, 13.0 percent of west region residents work in retail trade, and 9.9 percent work in accommodation and food services. These four industries account for 53.9 percent of all west region residents' employment.

East region residents work in mostly different industries than west and south region residents do. The top employment industries for east region residents are: professional, scientific, and technical services; health care and social assistance; educational services; accommodation and food services; and finance and insurance. The professional, scientific, and technical services industry accounts for 14.6 percent of east region residents' employment. **Figure B. 10** shows 13.6 percent of east region residents work in health care and social assistance. In the east region, 12.1 percent of residents work in educational services, 7.2 percent work in accommodation and food services, and 6.5 percent work in finance and insurance.



Figure B. 10: Distribution of Employment by Industry of Economic Study Area Regions and the Economic Study Area, 2014

Source: US Census Bureau, 2014; AECOM, 2016.



Resident Employment Location

Figure B. 11 shows where Cherry Hill residents work by ZIP code and Figure B. 12 shows where Brooklyn residents work by ZIP code. It is important to understand and visualize where and how far away people work from their residences. Lack of vehicles for households has already been observed in the south region, and observations and analysis of existing public transportation systems is reported later in this document. While most south region residents work less than 10 miles from their homes, a majority of these residents also do not have their own vehicles and rely heavily on public transportation and other alternative modes of transportation.

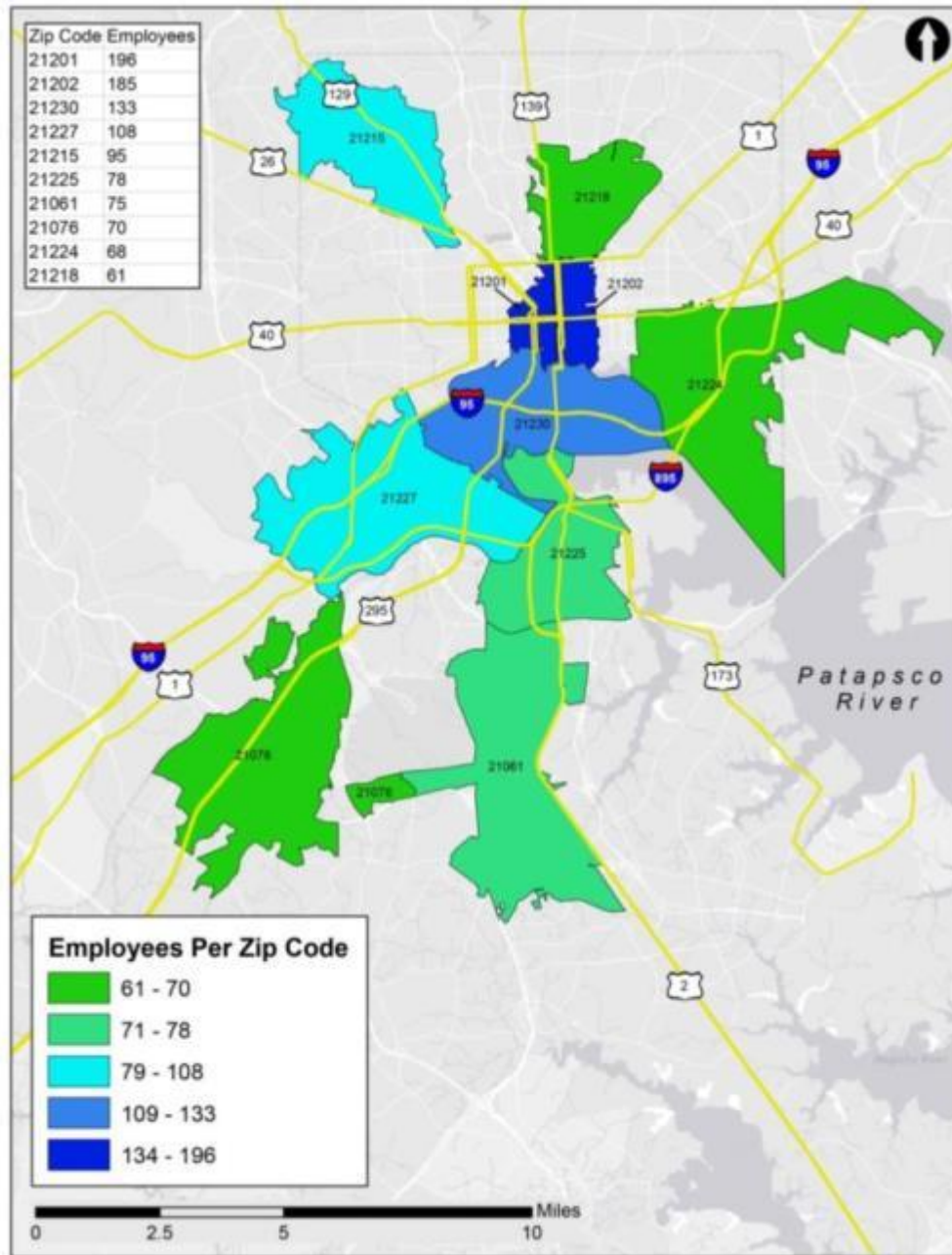
Figure B. 11 shows that 48 percent of Cherry Hill residents work in the Central Business District and South Baltimore. Around one-third – 30.1 percent – of Cherry Hill residents work in Anne Arundel County. The remainder – 20.9 percent – work further north or east of the CBD. Figure B. 12 shows the top two ZIP codes for where Brooklyn residents work to be in Anne Arundel County and the Baltimore





CBD: 21061 and 20201 respectively. Roughly 48.7 percent of Brooklyn residents work in Anne Arundel County with some working as far south as Annapolis.

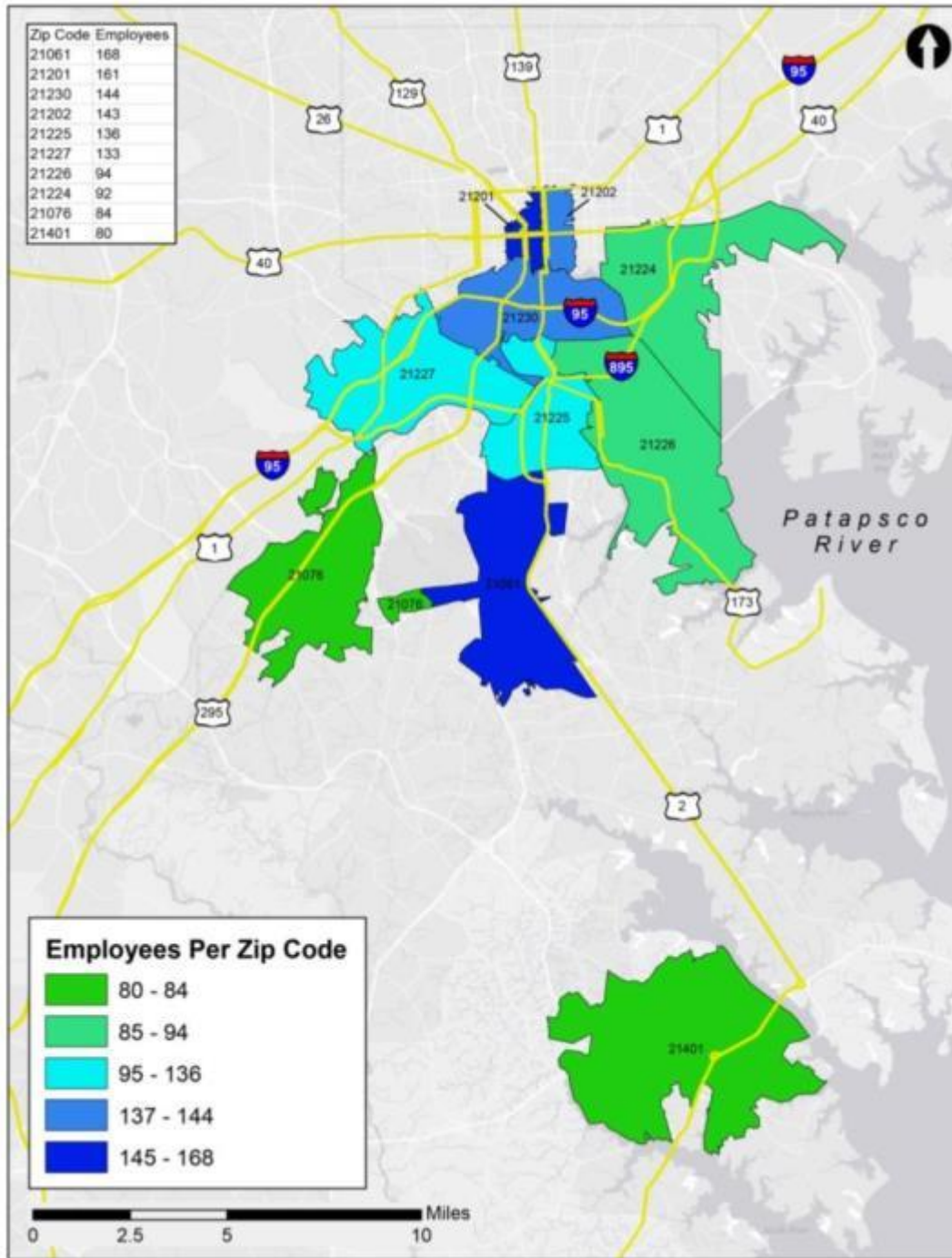
Figure B. 11: Where Cherry Hill Residents Work by Zip Code, 2014



Source: Census On the Map, 2014; AECOM, 2016



Figure B. 12: Where Brooklyn Residents work by Zip Code, 2014



Source: Census On the Map, 2014; AECOM, 2016



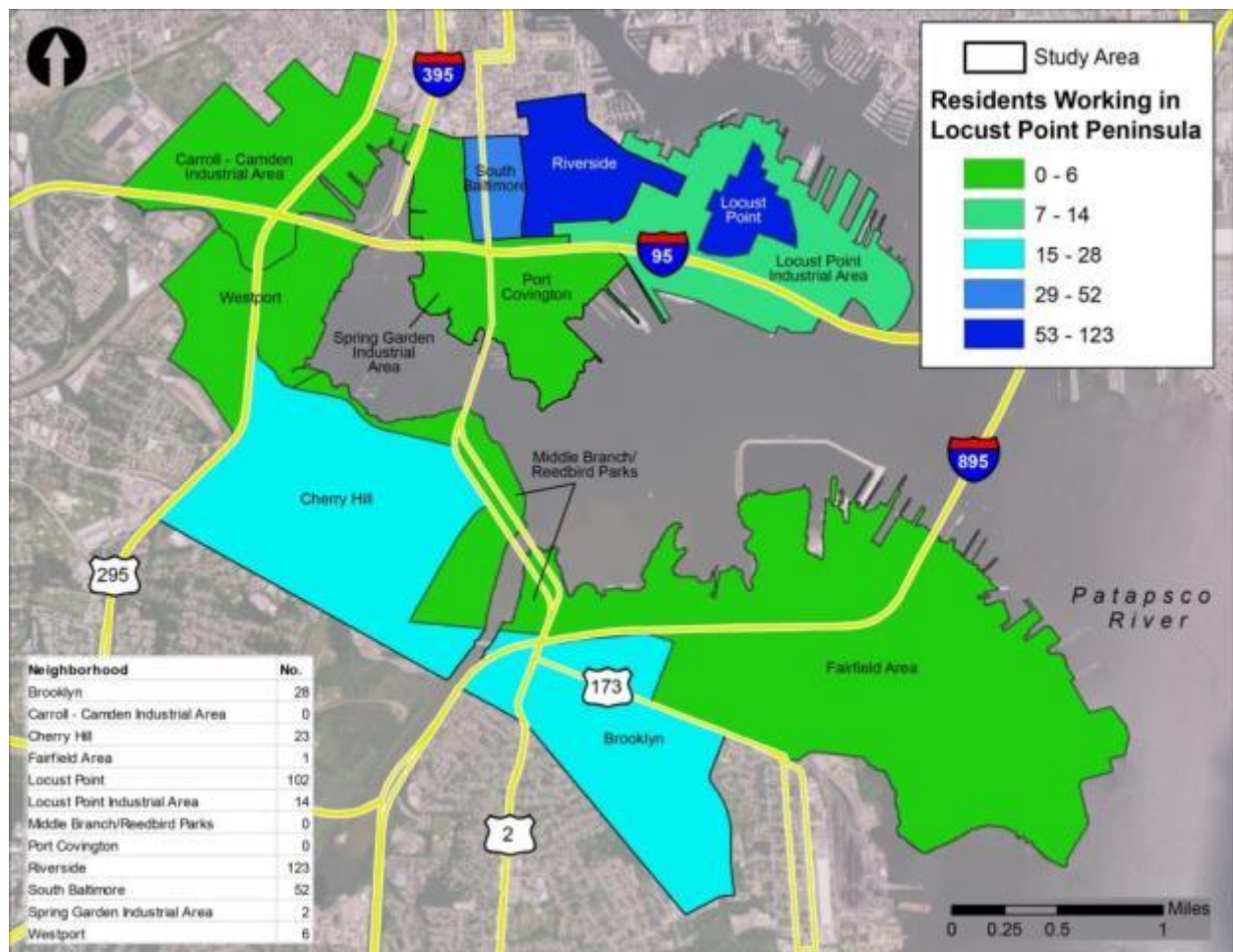


Business Employee Location

To determine where the area’s employees are traveling from, employees’ residences were mapped for the major employer concentrations in Fairfield and Locust Point, to show the concentrations of employees in Economic Study Area neighborhoods.

Locust Point has 351 of its 5,476 employees living in the Economic Study Area. Overall, 6.4 percent of employees in the Locust Point Peninsula (Locust Point and Locust Point Industrial Area neighborhoods) live in the Economic Study Area (see **Figure B. 13**). Only 0.9 percent lives south of the Vietnam Veterans Memorial Bridge in Cherry Hill, Brooklyn, or the Fairfield Industrial Area. The greatest concentrations of employees are in Riverside (2.2 percent) Locust Point (1.9 percent).

Figure B. 13: Locust Point Employees Residing in Economic Study Area Neighborhoods, 2014



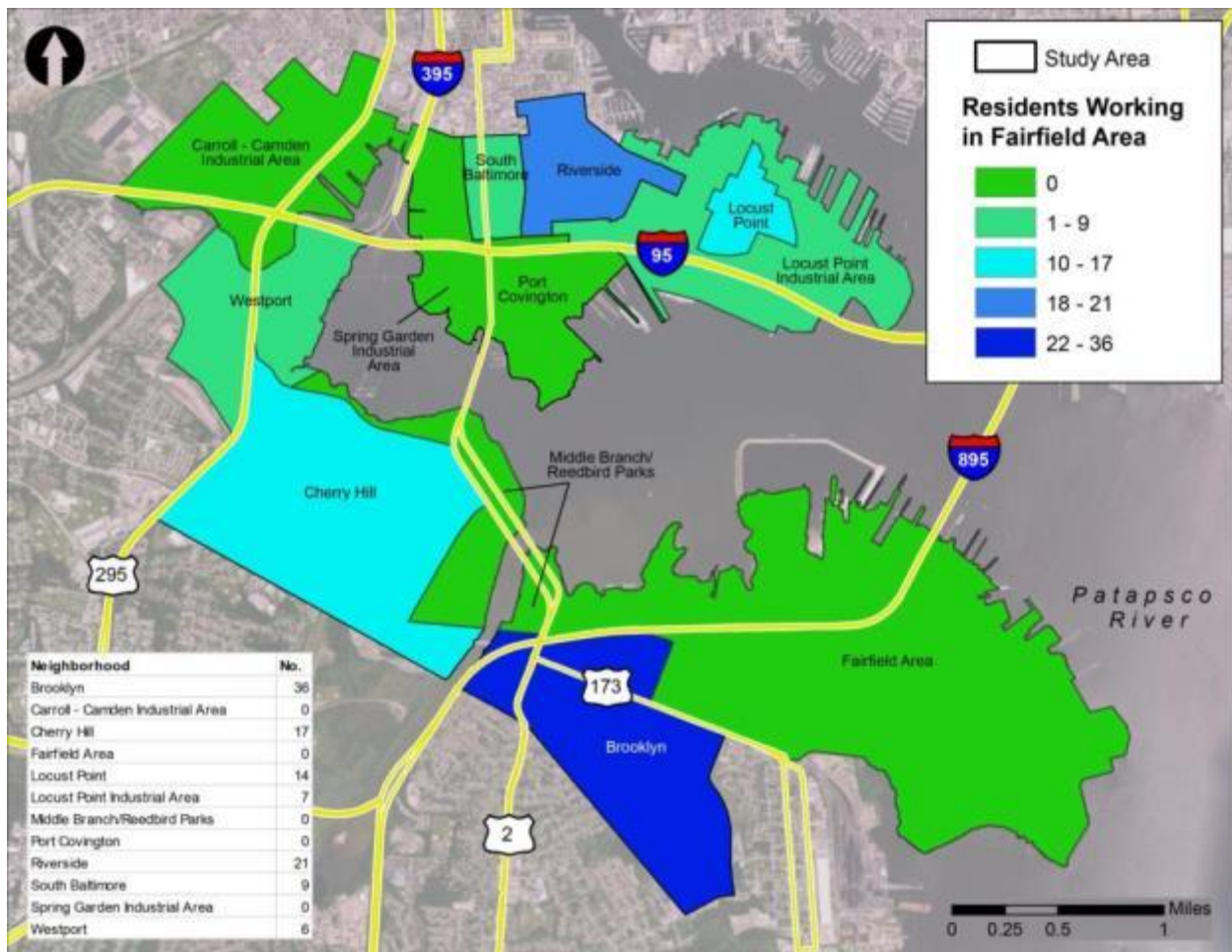
Source: Census On the Map, 2014; AECOM, 2016





Figure B. 14 shows that while some Fairfield workers do live in the Economic Study Area neighborhoods, most do not. A separate analysis showed that 19.5 percent of Fairfield workers live in Dundalk, and 9 percent live in the Lake Shore area. Only 3.2 percent of all Fairfield workers live in the Economic Study Area neighborhoods. Though there are no great concentrations of employees living in the Economic Study Area neighborhoods, the neighborhood with the highest concentration is Brooklyn, where 1.0 percent of employees in Fairfield live.

Figure B. 14: Fairfield Industrial Area Employees Living in Economic Study Area Neighborhoods, 2014



Source: Census On the Map, 2014; AECOM, 2016

Public Transportation

Because of the role transit plays in access to employment opportunities, this analysis considers the transit facilities available within the Economic Study Area. The City of Baltimore and the State of Maryland offer various public transportation systems to service Baltimore City and surrounding areas. There are currently four major transportation systems servicing Baltimore: Charm City Circulator, MDOT MTA Light Rail, MDOT MTA Metro, and MDOT MTA Bus. While these systems do provide service to





Baltimore's daytime population, service quality and quantity are not the same throughout the entire city. Charm City Circulator, the city's free shuttle service, only services the east portion of the Economic Study Area as seen in **Figure B. 15**. It is important to note that Charm City Circulator's hub is located in Cherry Hill but does not offer any routes or stops to service that area. MDOT MTA Light Rail has a line servicing residents near Cherry Hill, Westport, and the Carroll-Camden Industrial Area. MDOT MTA Bus also offers routes to service the aforementioned neighborhoods in addition to Brooklyn, South Baltimore, and Port Covington. While these bus routes do exist, stakeholder interviewees suggested that they may not be enough to get the residents of these neighborhoods to their places of employment. **Figure B. 4** shows how many households by census tract have zero vehicles available throughout the entire Economic Study Area. According to Census data, about 72 percent of all households in a census tract in Cherry Hill have no cars available. Residents in Cherry Hill and other South region neighborhoods are more likely to rely on public transportation than East region neighborhoods within the Economic Study Area. Despite these needs for transportation, networks and service are still somewhat limited. During stakeholder interviews, lack of accessible and effective transportation for South and West region neighborhoods was brought up repeatedly.

Figure B. 11 shows where residents of Cherry Hill work by ZIP code. Most Cherry Hill residents do not work where they live. Since 72 percent of households in Cherry Hill also do not own vehicles, they rely heavily on public transportation. By improving existing transportation infrastructure and creating a multimodal neighborhood, Cherry Hill residents will be able to get to their places of employment more easily, efficiently, and safely. According to the MDOT MTA Trip Planner (which is powered by Google Maps), a resident living in Cherry Hill using MDOT MTA Bus to get to The Walters Art Museum would take anywhere between 31 to 47 minutes depending on departure time. The Walters Art Museum was chosen as a work destination since it is located in the heart of the 21201 ZIP code, which is where almost 200 Cherry Hill residents work. Looking up the same trip on Google Maps by car would take only 10 to 20 minutes depending on traffic. The same trip would take 26 minutes by bike. While bikes are a more affordable method of transportation and would take less time to get to the destination, in this particular case, there is a lack of bike and pedestrian infrastructure in the South region of the Economic Study Area. This lack of bike and pedestrian infrastructure does not make these areas conducive to using this alternative mode of transportation.





Figure B. 15: Existing Public Transportation in the Economic Study Area



Source: City of Baltimore; Maryland Transportation Authority; AECOM, 2016.





Real Estate Market Overview

This section gives a snapshot of recent conditions in the rents, occupancy, and development of various land uses including residential, industrial, flex industrial, office, and retail in the Economic Study Area and comparative geographies.

Residential

As previously noted, in the Economic Study Area and Baltimore, more homes are renter-occupied than owner-occupied. Fifty-four percent of homes in the Economic Study Area, and 52 percent of homes in the City of Baltimore are rented rather than owned whereas only 33 percent of homes in the Baltimore MSA are rented. **Table B. 14** shows the distribution of owner-occupied housing by home values. Most owner-occupied housing values are evenly distributed from \$50,000 to \$399,999. In fact, 85.4 percent of all Economic Study Area owner-occupied homes fall into these value ranges. Most owner-occupied homes in the Economic Study Area are worth between \$50,000 - \$99,999 and \$300,000 - \$399,999 with 17.9 and 17.6 percent respectively. A majority – 70.9 percent – of owner-occupied houses in Baltimore are worth between \$50,000 and \$249,999. The Economic Study Area has a higher median home value than the City, at \$219,254 versus \$157,900.

Table B. 14: Owner-Occupied Housing Values of Economic Study Area and Surrounding Areas, 2015

Owner-Occupied Housing Values, 2015						
	Study Area		Baltimore		MSA	
	#	%	#	%	#	%
Total	5,908	100.0%	116,673	100.0%	688,984	100.0%
<\$50,000	197	3.3%	8,498	7.3%	24,783	3.6%
\$50,000-\$99,999	1,057	17.9%	20,848	17.9%	30,976	4.5%
\$100,000-\$149,999	634	10.7%	24,497	21.0%	51,164	7.4%
\$150,000-\$199,999	751	12.7%	23,179	19.9%	82,260	11.9%
\$200,000-\$249,999	818	13.8%	14,121	12.1%	99,505	14.4%
\$250,000-\$299,999	753	12.7%	8,374	7.2%	88,890	12.9%
\$300,000-\$399,999	1,038	17.6%	8,350	7.2%	129,960	18.9%
\$400,000-\$499,999	397	6.7%	3,530	3.0%	71,003	10.3%
\$500,000-\$749,999	202	3.4%	3,297	2.8%	77,103	11.2%
\$750,000-\$999,999	32	0.5%	1,037	0.9%	19,486	2.8%
\$1,000,000+	29	0.5%	942	0.8%	13,854	2.0%
Median House Value	\$219,254		\$157,900		\$281,400	

Source: ESRI; AECOM, April 2016.

Owner-occupied housing values may be higher than the City's overall owner-occupied housing values; however, there is disparity within the Economic Study Area itself, as shown in **Table B. 15**. South and west region owner-occupied housing values are lower than east region values. In the south region, 85.4 percent of owner-occupied houses are worth between \$50,000 and \$199,999. In the west region, 94.6 percent of owner-occupied houses are worth between \$0 and \$199,999. Conversely, 86.1 percent of owner-occupied houses in the east region are worth between \$150,000 and \$499,999. Median values in





the South and West are less than half that of the median home value in the East, where the median home value is \$279,979.

Table B. 15: Owner-Occupied Housing Values of Economic Study Area and Its Regions, 2015

Owner-Occupied Housing Values, 2015								
	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
Total	1,774	100.0%	297	100.0%	3,837	100.0%	5,908	100.0%
<\$50,000	78	4.4%	34	11.4%	87	2.3%	197	3.3%
\$50,000-\$99,999	890	50.2%	81	27.3%	86	2.2%	1,057	17.9%
\$100,000-\$149,999	366	20.6%	135	45.5%	132	3.4%	634	10.7%
\$150,000-\$199,999	285	16.1%	31	10.4%	435	11.3%	751	12.7%
\$200,000-\$249,999	56	3.2%	5	1.7%	758	19.8%	818	13.8%
\$250,000-\$299,999	44	2.5%	6	2.0%	703	18.3%	753	12.7%
\$300,000-\$399,999	23	1.3%	4	1.3%	1,012	26.4%	1,038	17.6%
\$400,000-\$499,999	0	0.0%	0	0.0%	397	10.3%	397	6.7%
\$500,000-\$749,999	7	0.4%	3	1.0%	192	5.0%	202	3.4%
\$750,000-\$999,999	7	0.4%	0	0.0%	25	0.7%	32	0.5%
\$1,000,000+	17	1.0%	17	5.7%	12	0.3%	29	0.5%
Median House Value	\$97,068		\$110,147		\$279,979		\$219,254	

Source: ESRI; AECOM, April 2016.

Table B. 16 shows renter-occupied housing values in the Economic Study Area, Baltimore City, and Baltimore MSA. While owner-occupied housing values were higher in the Economic Study Area than they were in the City, renter-occupied housing values are lower in the Economic Study Area than the City. In the Economic Study Area, 74.3 percent of renter-occupied houses have rents between \$0 and \$999. A majority – 85.1 percent – of renter-occupied houses in Baltimore have rents between \$0 and \$1,249. In the MSA, 82.6 percent of renter-occupied houses have rents between \$0 and \$1,499. 23.5 percent of renter-occupied houses in the Economic Study Area and 23.5 percent of renter-occupied houses in Baltimore have rents greater than \$1,000. Almost double – 45 percent – of renter-occupied houses in the MSA have rents greater than \$1,000.





Table B. 16: Renter-Occupied Housing Values of Economic Study Area and Surrounding Areas, 2013

Renter-Occupied Housing Values: Rents, 2013						
	Study Area		Baltimore		MSA	
	#	%	#	%	#	%
Total	6,940	100.0%	124,782	100.0%	340,338	100.0%
With cash rent	6,780	97.7%	120,895	96.9%	328,723	96.6%
Less than \$500	1,879	27.1%	28,786	23.1%	44,424	13.1%
\$500 to \$699	1,398	20.1%	23,430	18.8%	38,986	11.5%
\$700 to \$999	1,878	27.1%	40,695	32.6%	103,600	30.4%
\$1,000 to \$1,249	406	5.9%	13,208	10.6%	57,404	16.9%
\$1,250 to \$1,499	402	5.8%	6,738	5.4%	36,553	10.7%
\$1,500 to \$1,999	428	6.2%	5,357	4.3%	33,859	9.9%
\$2,000 or more	390	5.6%	2,681	2.1%	13,897	4.1%
No cash rent	160	2.3%	3,887	3.1%	11,615	3.4%
Median Rent		\$707		\$751		\$929

Source: US Census Bureau ACS 2013.

Just as with owner-occupied housing values, renter-occupied housing rents vary greatly among the Economic Study Area regions (see Table B. 17). In the south region, 91.9 percent of renter-occupied houses have rents under \$1,000. In the west region, 39.7 percent of renter-occupied houses have rents less than \$500, and 51.1 percent have rents between \$700 and \$1,249. In the east region, 86.8 percent of renter-occupied houses have rents greater than \$700. In the south region, only 5.4 percent of renter-occupied houses have rents greater than \$1,000. In the west region, 23 percent of renter-occupied houses have rents greater than \$1,000. In the east region, 71.8 percent of renter-occupied houses have rents greater than \$1,000. The median rent in the South region is \$654, compared to \$1,414 in the East.

Table B. 17: Renter-Occupied Housing Values of Economic Study Area and Its Regions, 2013

Renter-Occupied Housing Values: Rents, 2013								
	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
Total	5,014	100.0%	174	100.0%	1,752	100.0%	6,940	100.0%
With cash rent	4,934	98.4%	174	100.0%	1,671	95.4%	6,780	97.7%
Less than \$500	1,711	34.1%	69	39.7%	97	5.5%	1,879	27.1%
\$500 to \$699	1,332	26.6%	15	8.6%	53	3.0%	1,398	20.1%
\$700 to \$999	1,564	31.2%	50	28.7%	263	15.0%	1,878	27.1%
\$1,000 to \$1,249	170	3.4%	39	22.4%	198	11.3%	406	5.9%
\$1,250 to \$1,499	60	1.2%	0	0.0%	342	19.5%	402	5.8%
\$1,500 to \$1,999	89	1.8%	1	0.6%	338	19.3%	428	6.2%
\$2,000 or more	9	0.2%	0	0.0%	381	21.7%	390	5.6%
No cash rent	80	1.6%	0	0.0%	81	4.6%	160	2.3%
Median Rent		\$654		\$769		\$1,414		\$707

Source: US Census Bureau ACS 2013.





Table C. 3 shows the summary profile of the multifamily real estate market in the Economic Study Area, City of Baltimore, Baltimore MSA, and Maryland. As of Q4 2015, the Economic Study Area has a multifamily vacancy rate of 7.8 percent. The average rental rate for multifamily units in the Economic Study Area is \$1,152, and the average unit is 945 square feet. The average rent per square foot is \$1.08. Currently, the Economic Study Area has 30 multifamily buildings and 5,405 units. The Economic Study Area has an annual average multifamily absorption of 48 units (The “absorption” rate is the rate at which available homes or properties are sold or rented in a specific real estate market during a given period of time). No new units have been delivered in the Economic Study Area since 2011.

Industrial

Table C. 4 shows a summary profile of the industrial real estate market in the Economic Study Area, City of Baltimore, Baltimore MSA, and Maryland. As of Q4 2015, the Economic Study Area had an industrial vacancy rate of 8.4 percent; however the average annual direct vacancy rate is 9.5 percent. The average annual vacancy rate is lowest in the Economic Study Area; the City, MSA, and State have higher vacancy rates. The average rental rate for industrial units in the Economic Study Area is \$4.40 triple net (NNN). Triple net is a type of lease agreement where the lessee is responsible for all asset costs in addition to rent (property taxes, building insurance, etc.). As of Q4 2015, the Economic Study Area’s average rental rate is similar to the City and the MSA’s average industrial rental rates, which are \$4.90 and \$4.92 respectively. The average annual rent direct (NNN) is \$3.86. Currently, the Economic Study Area has 37 industrial buildings and 2.9 million square feet of industrial space. The Economic Study Area has had a negative annual average industrial absorption of -18,003 square feet, while the surrounding areas have been positive. No new space has been delivered in the Economic Study Area since before 2011.

Because industrial land uses are common in the Economic Study Area, the industrial real estate market within the Economic Study Area was observed in more detail, as tracked by CoStar, a proprietary database of commercial real estate transactions. This observation included breaking down the industrial real estate market by Economic Study Area region and by subcategory. The following subcategories were assessed: distribution, manufacturing, truck terminals, and warehouses. Note that this data only includes tracked rental space on the commercial real estate market, and does not contain owner-occupied space.

As shown in **Table B. 18**, there are 234 industrial buildings (including but not limited to distribution, manufacturing, truck terminals, and warehouses). A majority – 49.1 percent – of industrial buildings are located in the south region. The west region has the most industrial space with 4,226,355 square feet. The average rent per square foot of industrial space in the Economic Study Area is \$5.01. The east region has the highest average rent per square foot with \$6.41. The south region has the lowest average rent per square foot with \$4.51.





Table B. 18: Summary of Industrial Real Estate Market Conditions by Economic Study area and Its Regions

Industrial Summary			
	Buildings	SQ FT	Ave Rent
South	115	3,806,786	\$4.51
West	79	4,226,355	\$4.73
East	45	1,687,411	\$6.41
Study Area	234	9,588,123	\$5.01

Source: CoStar; AECOM, 2016.

Table B. 19 shows a snapshot of the distribution real estate market within the Economic Study Area. There are only six distribution facilities in the Economic Study Area and half of them are in the south region. A majority – 85.5 percent – of industrial distribution facility space is located in the south region.

Table B. 19: Summary of Distribution Real Estate Market Conditions by Economic Study area and Its Regions

Industrial - Distribution			
	Buildings	SQ FT	Ave Rent
South	3	371,532	-
West	2	53,500	-
East	1	9,325	-
Study Area	6	434,357	-

Source: CoStar; AECOM, 2016.

The distribution of manufacturing facilities is almost completely equal among the three regions in the Economic Study Area: 33.3 percent of these facilities are in the south region, 30 percent are in the west, and 36.7 percent are in the east region. Despite the west region having the fewest number of buildings, it has more than half – 57.5 percent – of all Economic Study Area manufacturing space. The average rent for manufacturing space in the Economic Study Area is \$4.95 per square foot. An average rent figure was not available for manufacturing facilities in the east region. The west region has the highest average rent - \$8.00 per square foot.

Table B. 20: Summary of Manufacturing Real Estate Market Conditions by Economic Study area and Its Regions

Industrial - Manufacturing			
	Buildings	SQ FT	Ave Rent
South	10	398,143	\$4.95
West	9	833,667	\$8.00
East	11	221,843	-
Study Area	30	1,448,553	\$4.95

Source: CoStar; AECOM, 2016.





Table B. 21 shows a snapshot of the truck terminal real estate conditions within the Economic Study Area. There are four truck terminal facilities within the Economic Study Area. Most of the truck terminals are in the west region. Average rent for truck terminal facilities was only available for the west region and the Economic Study Area as a whole, which is the same: \$10.71 per square foot.

Table B. 21: Summary of Truck Terminal Real Estate Market Conditions by Economic Study area and Its Regions

Industrial - Truck Terminal			
	Buildings	SQ FT	Ave Rent
South	1	6,300	-
West	3	39,468	\$10.71
East	-	-	-
Study Area	4	45,768	\$10.71

Source: CoStar; AECOM, 2016.

There are 160 warehouses in the Economic Study Area. 48.1 percent of warehouses are in the south region, 35.6 percent are in the west region; and 16.3 percent are in the east region. Almost half – 45.4 percent – of all warehouse space is located in the west region. The average rent per square foot of warehouse space in the Economic Study Area is \$4.98. The east region has the highest rental rates for warehouse space at \$6.41 per square foot. The west region has the cheapest average rent per square foot at \$3.98.

Table B. 22: Summary of Warehouse Real Estate Market Conditions by Economic Study area and Its Regions

Industrial - Warehouse			
	Buildings	SQ FT	Ave Rent
South	77	2,679,152	\$4.19
West	57	3,097,559	\$3.98
East	26	1,003,519	\$6.41
Study Area	160	6,824,514	\$4.98

Source: CoStar; AECOM, 2016.

Flex

In real estate, “industrial flex,” or “flex” space, is used to describe industrial buildings that also include some office space. Included in this category are research and development labs, tech/telecom facilities, warehouse with offices but not a warehouse only facility. Generally, they are most often one-story and may or may not be air conditioned. Some have loading docks, though not all. **Table C. 5** shows the summary of flex real estate market performance in the Economic Study Area, City of Baltimore, MSA, and Maryland. As of Q4 2015, the Economic Study Area has a flex vacancy rate of 6.4 percent; however the average annual direct vacancy rate is 10.5 percent. The average annual vacancy rate is lowest in the MSA and second lowest in the Economic Study Area. The average rental rate for flex units in the



Economic Study Area is \$6.60 full service (fs). The average annual rent direct (fs) is \$6.97, which is lower than the City, MSA, and State. Currently, the Economic Study Area has 21 flex buildings and 524,333 square feet of flex space. The Economic Study Area has annual average flex absorption of 4,339 square feet. No new units have been delivered in the Economic Study Area or City since before 2011. The MSA and State have delivered thousands of square feet of rentable building area since 2011.

Within the Economic Study Area, there are 21 flex buildings, with the most being in the south region and the fewest in the east region (see **Table B. 23**). The west region has the most flex space with 287,214 square feet. The average rent per square foot from 2011 to 2015 was \$6.95 in the Economic Study Area. The east region has the highest average rent per square foot for the same time period at \$14.33. . The south and west regions have similar average rent per square feet figures of \$7.33 and \$6.75 respectively. The average rents are based on the rates for available space in that time period. Much of the available space in the South and West areas has been in older buildings, while the flex space available in the East is in a newer more office-like flex building.

Table B. 23: Summary of Flex Real Estate Market Conditions by Economic Study area and Its Regions

Flex - Summary			
	Buildings	SQ FT	Ave Rent
South	9	159,829	\$6.47
West	8	287,214	\$6.75
East	4	77,290	\$16.00
Study Area	21	524,333	\$6.60

Source: CoStar; AECOM, 2016.

Office

Table C. 6 shows the summary of office real estate market performance in the Economic Study Area, City of Baltimore, MSA, and Maryland. For Class-A office space real estate performance, see **Table C. 7**. For Class-B office space real estate performance, see **Table C. 8**.

As of Q4 2015, the Economic Study Area has an office vacancy rate of 15.1 percent. The average annual vacancy rate is highest in the Economic Study Area; the City, MSA, and State have much lower vacancy rates. The average rental rate for industrial units in the Economic Study Area is \$20.33. As of Q4 2015, the Economic Study Area's average rental rate is slightly less than the City and the MSA's average office rental rates, which are \$21.09 and \$21.90 respectively. The average annual rent direct full service (fs) is \$22.60. Full service is a type of lease where the rent being paid by the lessee includes fees associated with building ownership or maintenance, such as utilities, insurance, taxes, or maintenance. Currently, the Economic Study Area has 103 office buildings and 3,748,964 square feet of office space. The Economic Study Area has annual average office absorption of 32,161 square feet. Since 2011, the rentable building area delivered has averaged 16,111 square feet annually.





Retail

Table C. 9 shows the summary of retail real estate market performance in the Economic Study Area, City of Baltimore, MSA, and Maryland.

The Economic Study Area has a total of 1.8 million square feet of retail in 369 buildings. As of Q4 2015, the Economic Study Area has a retail vacancy rate of 1.2 percent. In the last five years, the average annual vacancy rate was highest in the Economic Study Area – 8.3 percent; the City, MSA, and State have lower average annual direct vacancy rates. The Economic Study Area has a low retail rent. The average rental rate for retail square feet in the Economic Study Area is \$11.62 triple net (NNN). As of Q4 2015, the Economic Study Area’s average rental rate is a few dollars less than the City and the MSA’s average office rental rates, which are \$14.19 and \$18.26 respectively. The average annual rent direct (NNN) is \$11.53. The Economic Study Area has annual average retail absorption of 14,616 square feet. Since 2011, the rentable building area delivered has averaged only 1,627 square feet annually.

Table B. 24 shows the summary of retail businesses by retail type within the Economic Study Area. Of 193 retail trade businesses in the Economic Study Area, 93 are located in the south region, 41 are in the west region, and 59 are in the east region. In the south region, a majority – 32.3 percent – of the retail trade businesses are food and beverage stores. After food and beverage stores, motor vehicle and parts dealers is the second largest retail trade type by number of businesses in the south region. In the west region, a majority – 22 percent – of retail trade businesses are building materials, garden equipment, and suppliers/ dealers. In the east region the top two retail trades by amount of businesses are food and beverage stores and electronics and appliance stores. In the entire Economic Study Area, food and beverage stores and motor vehicle and parts and dealers are the two largest types of retail trades by number of businesses. Of all retail trade businesses in the Economic Study Area, 23.8 percent are food and beverage stores, and 11.4 percent, which is the second largest share, are motor vehicle and parts and dealers.

Table B. 24: Summary of Types of Retail Businesses in Economic Study Area and Its Regions

Summary of Retail Type Businesses, 2016								
	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
Total Retail Trade	93	100.0%	41	100.0%	59	100.0%	193	100.0%
Motor Vehicle & Parts Dealers	12	12.9%	6	14.6%	4	6.8%	22	11.4%
Furniture & Home Furnishings Stores	3	3.2%	3	7.3%	2	3.4%	9	4.7%
Electronics & Appliance Stores	8	8.6%	2	4.9%	9	15.3%	19	9.8%
Bldg Material & Garden Equipment & Suppliers Dealers	3	3.2%	9	22.0%	2	3.4%	14	7.3%
Food & Beverage Stores	30	32.3%	5	12.2%	11	18.6%	46	23.8%
Health & Personal Care Stores	10	10.8%	2	4.9%	6	10.2%	18	9.3%
Gasoline Stations	6	6.5%	4	9.8%	5	8.5%	15	7.8%
Clothing and Clothing Accessories Stores	6	6.5%	4	9.8%	6	10.2%	17	8.8%
Sports Goods, Hobby, Book, & Music Stores	1	1.1%	1	2.4%	1	1.7%	4	2.1%
General Merchandise Stores	8	8.6%	1	2.4%	4	6.8%	13	6.7%
Miscellaneous Store Retailers	4	4.3%	5	12.2%	8	13.6%	16	8.3%

Source: ESRI; AECOM, 2016.





Food Deserts

While the data in **Table B. 24** show that the South has the largest number of food and beverage stores, there is still a “food desert” there. “Food deserts” are areas without access to fresh produce and groceries. Many jurisdictions use different measures to define a food desert. The Baltimore Office of Sustainability characterizes food deserts in the *Food Environment Report* as areas where all of the following are true:

- “The distance to the supermarket/supermarket alternative is more than ¼ mile”
- “The median household income is at or below 185 percent of the Federal Poverty Level” (Currently at \$37,296).
- “Over 30 percent of households have no vehicle”
- “The average Healthy Food Availability Index score for all food stores is low”

These factors combined constitute a food desert, by City of Baltimore standards. The Economic Study Area has two food deserts in the South region.

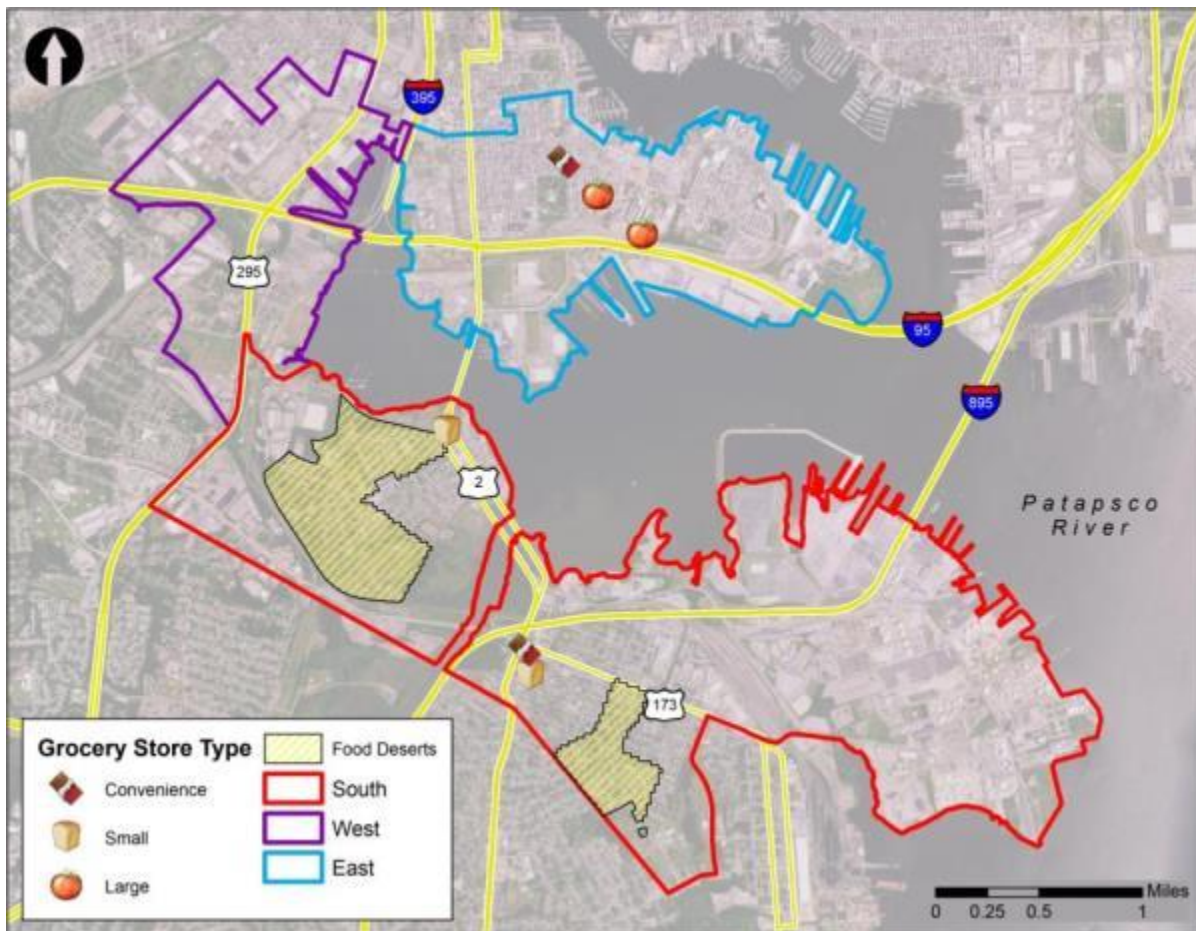




Figure B. 16 shows where the food deserts are and the nearest grocery store and store type.



Figure B. 16: Economic Study Area Food Deserts and Grocery Stores by Type



Source: City of Baltimore; ESRI; AECOM, 2016

Figure B. 4 shows how many households in each census tract within the Economic Study Area have zero vehicles available. There is overlap between the census tract with 72 percent of households without any vehicles available and the food desert closer to the Vietnam Veterans Memorial Bridge. The neighborhoods in the South region of the Economic Study Area have fewer ways to travel to proper grocery stores such as the Shoppers or Harris Teeter on the other side of the Vietnam Veterans Memorial Bridge in the East region of the Economic Study Area. There was previously a Walmart across the Vietnam Veterans Memorial Bridge that served these populations for their grocery needs. When Walmart closed, these neighborhoods were left without an affordable or accessible grocery store.



APPENDIX C

ADDITIONAL ECONOMIC DATA





Table C. 1: Comparison of Income Distributions Between Economic Study Area and Surrounding Areas, 2015

Household Income, 2015								
Household Income	Study Area		Baltimore		Baltimore MSA		Maryland	
	#	%	#	%	#	%	#	%
< \$25,000	4,275	31.3%	82,505	32.8%	180,288	16.9%	328,796	14.8%
\$25,000 - \$49,999	3,162	23.1%	68,353	27.2%	203,757	19.1%	408,773	18.4%
\$50,000 - \$74,999	2,393	17.5%	43,079	17.1%	186,688	17.5%	391,001	17.6%
\$75,000 - \$99,999	1,440	10.5%	25,323	10.1%	154,685	14.5%	333,239	15.0%
\$100,000 - \$149,999	1,106	8.1%	16,812	6.7%	161,085	15.1%	359,898	16.2%
\$150,000 +	1,299	9.5%	15,330	6.1%	180,288	16.9%	399,887	18.0%
Total	13,675	100.0%	251,402	100.0%	1,066,791	100.0%	2,221,594	100.0%
Median Household Income	\$43,991		\$39,306		\$68,363		\$73,534	
Average Household Income	\$63,970		\$56,463		\$93,905		\$98,361	
Per Capita Income	\$26,907		\$23,599		\$36,492		\$37,133	

¹Total values may differ slightly due to rounding errors.

Source: ESRI; AECOM, April 2016

Table C. 2: Comparison of Income Distributions Between Economic Study Area and Its Regions, 2015

Household Income, 2015								
Household Income	South		West		East		Study Area	
	#	%	#	%	#	%	#	%
< \$25,000	3,356	49.1%	296	52.0%	622	9.9%	4,275	31.3%
\$25,000 - \$49,999	2,028	29.7%	142	25.0%	992	15.8%	3,162	23.1%
\$50,000 - \$74,999	864	12.6%	55	9.7%	1,474	23.5%	2,393	17.5%
\$75,000 - \$99,999	398	5.8%	48	8.4%	994	15.8%	1,440	10.5%
\$100,000 - \$149,999	153	2.2%	26	4.6%	927	14.8%	1,106	8.1%
\$150,000 +	33	0.5%	1	0.2%	1,264	20.1%	1,299	9.5%
Total	6,832	100.0%	569	99.8%	6,274	100.0%	13,675	100.0%
Median Household Income	\$25,457		\$23,404		\$75,890		\$43,991	
Average Household Income	\$33,106		\$34,570		\$100,246		\$63,970	
Per Capita Income	\$12,202		\$12,602		\$49,773		\$26,907	

¹Total values may differ slightly due to rounding errors.

Source: ESRI; AECOM, April 2016



Table C. 3: Multifamily Real Estate Market Performance

Summary Profile of Multifamily Market

Summary Data - Q3 2015 to Date						
Study Area	Number of Buildings	Total Units	Avg. Unit Square Feet	Average Rental Rate	Average Vacancy Rate	
Study Area	30	5,405	945	\$1,152	7.80%	
Baltimore, City	1,369	97,937	813	\$1,071	4.50%	
Baltimore, MSA	2,230	246,050	885	\$1,191	3.60%	
Maryland	4,340	500,106	894	\$1,296	3.70%	

Total Units						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	4,916	5,202	5,193	5,193	5,405	5,182
Baltimore, City	93,554	94,481	95,903	96,993	97,937	95,774
Baltimore, MSA	234,202	236,846	240,633	243,679	246,050	240,282
Maryland	474,582	479,622	485,495	492,828	500,106	486,527

Average Unit Square Feet						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	955	946	946	946	945	948
Baltimore, City	812	812	814	814	813	813
Baltimore, MSA	881	882	884	885	885	883
Maryland	890	891	893	893	894	892

Absorption (Units), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	256	37	(80)	14	11	48
Baltimore, City	384	142	131	(176)	(316)	33
Baltimore, MSA	2,359	3,106	2,533	3,315	2,803	2,823
Maryland	4,441	6,352	5,403	6,800	8,624	6,324

Units Delivered (Annual totals)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	250	0	0	0	0	50
Baltimore, City	250	74	124	0	0	90
Baltimore, MSA	1,996	2,668	3,965	3,324	2,521	2,895
Maryland	4,183	5,064	6,522	8,553	7,496	6,364

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	3.8%	6.6%	6.9%	5.3%	7.8%	6.1%
Baltimore, City	3.9%	3.8%	3.9%	4.2%	4.5%	4.1%
Baltimore, MSA	4.0%	3.7%	4.2%	3.9%	3.6%	3.9%
Maryland	4.4%	4.0%	4.1%	4.1%	3.7%	4.1%

Average Monthly Rent						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$895.00	\$995.00	\$1,015.00	\$1,037.00	\$1,152.00	\$1,018.80
Baltimore, City	\$911.00	\$944.00	\$975.00	\$1,016.00	\$1,071.00	\$983.40
Baltimore, MSA	\$1,047.00	\$1,079.00	\$1,104.00	\$1,137.00	\$1,191.00	\$1,111.60
Maryland	\$1,176.00	\$1,203.00	\$1,221.00	\$1,243.00	\$1,296.00	\$1,227.80

Average Rent per Square Foot						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$0.95	\$1.06	\$1.09	\$1.10	\$1.20	\$1.08
Baltimore, City	\$1.12	\$1.16	\$1.20	\$1.25	\$1.32	\$1.21
Baltimore, MSA	\$1.20	\$1.23	\$1.26	\$1.30	\$1.36	\$1.27
Maryland	\$1.33	\$1.36	\$1.38	\$1.40	\$1.46	\$1.39

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property; AECOM, April 2016





Table C. 4: Industrial Real Estate Market Performance

Summary Profile of Industrial Market

Summary Data - Q3 2015 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (nnn)	
Study Area	37	2,899,398	8.4%	\$4.40	
Baltimore, City	338	18,390,920	9.8%	\$4.90	
Baltimore, MSA	3,413	181,865,763	9.8%	\$4.92	
Maryland	7,057	310,178,186	9.1%	\$5.82	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	3,223,982	3,223,982	3,223,982	3,223,982	2,899,398	3,159,065
Baltimore, City	18,627,384	18,627,384	18,627,384	18,715,504	18,390,920	18,597,715
Baltimore, MSA	180,341,450	180,647,644	180,797,319	183,618,078	181,865,763	181,454,051
Maryland	306,769,976	306,770,792	307,250,629	309,987,468	310,178,186	308,191,410

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	95,840	153,162	12,829	(15,685)	(336,160)	(18,003)
Baltimore, City	(29,983)	51,540	254,556	88,411	(332,693)	6,366
Baltimore, MSA	163,288	(1,210,460)	783,212	3,835,014	(1,739,350)	366,341
Maryland	362,262	504,727	1,362,217	4,268,700	24,575	1,304,496

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	0	0	0	0	0	0
Baltimore, City	0	60,000	0	37,120	51,000	29,624
Baltimore, MSA	46,029	116,145	1,099,734	3,440,728	3,007,810	1,542,089
Maryland	108,912	185,712	1,739,200	3,628,317	5,071,516	2,146,731

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	12.7%	8.1%	7.0%	8.6%	11.0%	9.5%
Baltimore, City	11.7%	11.7%	10.5%	10.2%	10.9%	11.0%
Baltimore, MSA	10.7%	11.1%	11.0%	9.7%	10.4%	10.6%
Maryland	10.5%	10.2%	10.1%	9.2%	9.4%	9.9%

Average Annual Direct Rent (nnn)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$3.27	\$3.72	\$3.75	\$4.13	\$4.45	\$3.86
Baltimore, City	\$4.30	\$4.49	\$5.12	\$4.76	\$4.68	\$4.67
Baltimore, MSA	\$4.68	\$4.76	\$4.83	\$4.79	\$5.02	\$4.82
Maryland	\$5.32	\$5.36	\$5.56	\$5.45	\$5.90	\$5.52

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





Table C. 5: Flex Real Estate Market Performance

Summary Profile of Flex Market

Summary Data - Q3 2015 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (fs)	
Study Area	21	524,333	6.4%	\$6.60	
Baltimore, City	200	5,830,789	11.5%	\$7.98	
Baltimore, MSA	1,439	50,291,728	9.1%	\$11.07	
Maryland	2,333	81,993,108	10.5%	\$10.88	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	554,333	524,333	524,333	524,333	524,333	530,333
Baltimore, City	5,895,289	5,865,289	5,856,789	5,856,789	5,830,789	5,860,989
Baltimore, MSA	49,851,090	49,888,210	50,046,570	50,145,990	50,219,850	50,030,342
Maryland	81,021,650	81,400,041	81,472,401	81,871,821	81,890,630	81,531,309

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	11,431	(17,387)	31,600	(1,164)	(2,786)	4,339
Baltimore, City	1,346	(71,127)	76,730	67,737	63,750	27,687
Baltimore, MSA	400,940	(19,949)	562,481	496,766	142,234	316,494
Maryland	223,121	407,620	500,434	1,158,529	699,536	597,848

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	0	0	0	0	0	0
Baltimore, City	0	0	0	0	0	0
Baltimore, MSA	131,330	67,120	166,860	99,420	135,990	120,144
Maryland	171,205	408,391	190,860	399,420	185,939	271,163

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	15.3%	13.0%	10.1%	6.4%	8.0%	10.5%
Baltimore, City	15.0%	16.2%	15.2%	14.0%	13.1%	14.7%
Baltimore, MSA	11.0%	10.9%	10.3%	9.3%	9.0%	10.1%
Maryland	13.4%	13.5%	13.1%	12.0%	11.4%	12.7%

Average Annual Direct Rent (fs)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$6.75	\$6.54	\$6.05	\$7.36	\$8.13	\$6.97
Baltimore, City	\$9.29	\$12.84	\$8.13	\$7.64	\$7.54	\$9.09
Baltimore, MSA	\$9.69	\$11.18	\$10.79	\$11.09	\$10.99	\$10.75
Maryland	\$10.79	\$11.23	\$11.30	\$11.25	\$11.08	\$11.13

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





Table C. 6: Office Real Estate Market Performance

Summary Profile of Office Market

Summary Data - Q3 2015 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (fs)	
Study Area	103	3,748,964	15.1%	\$20.33	
Baltimore, City	2,080	56,064,140	10.0%	\$21.09	
Baltimore, MSA	6,314	138,695,223	10.6%	\$21.90	
Maryland	11,504	268,348,352	12.3%	\$23.58	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	3,702,349	3,702,349	3,702,349	3,748,964	3,748,964	3,720,995
Baltimore, City	56,305,019	56,221,739	56,526,813	56,610,454	56,064,140	56,345,633
Baltimore, MSA	136,095,935	137,034,206	138,180,653	138,656,398	138,695,223	137,732,483
Maryland	262,571,554	264,912,234	266,317,539	267,975,328	268,348,352	266,025,001

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	53,245	45,837	39,376	42,210	(19,861)	32,161
Baltimore, City	478,759	430,269	748,225	(361,644)	40,986	267,319
Baltimore, MSA	1,548,700	1,327,608	1,344,722	661,654	1,209,070	1,218,351
Maryland	1,533,695	2,507,122	1,010,362	635,464	1,795,981	1,496,525

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	0	33,942	0	46,615	0	16,111
Baltimore, City	41,634	119,477	684,200	336,897	67,504	249,942
Baltimore, MSA	1,281,578	1,076,532	1,635,828	583,452	489,703	1,013,419
Maryland	1,701,317	2,463,513	2,161,883	1,945,555	882,925	1,831,039

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	16.3%	15.4%	14.6%	14.6%	14.8%	15.1%
Baltimore, City	11.6%	10.7%	9.9%	10.6%	10.3%	10.6%
Baltimore, MSA	12.0%	11.7%	11.3%	11.3%	10.7%	11.4%
Maryland	12.3%	12.2%	12.3%	12.6%	12.3%	12.3%

Average Annual Direct Rent (fs)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$24.19	\$20.95	\$20.89	\$20.77	\$26.19	\$22.60
Baltimore, City	\$19.79	\$19.94	\$19.66	\$19.91	\$20.86	\$20.03
Baltimore, MSA	\$21.41	\$21.52	\$21.36	\$21.17	\$22.06	\$21.50
Maryland	\$23.38	\$23.15	\$23.12	\$23.05	\$23.74	\$23.29

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





Table C. 7: Class A Office Real Estate Market Performance

Summary Profile of Class-A Office Market

Summary Data - Q1 2016 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (fs)	
Study Area	5	1,542,490	26.8%	\$26.50	
Baltimore, City	81	17,228,197	12.2%	\$24.49	
Baltimore, MSA	382	46,190,442	10.8%	\$25.59	
Maryland	715	97,649,956	13.9%	\$27.31	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	1,542,490	1,542,490	1,542,490	1,542,490	1,542,490	1,542,490
Baltimore, City	16,715,869	16,831,310	17,063,493	17,185,493	17,228,197	17,004,872
Baltimore, MSA	44,023,045	44,875,009	45,630,858	46,027,858	46,190,442	45,349,442
Maryland	92,321,238	94,547,819	95,636,382	97,138,211	97,649,956	95,458,721

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	40,330	50,510	12,623	(5,043)	(8,207)	18,043
Baltimore, City	373,559	248,608	654,950	211,775	171,975	332,173
Baltimore, MSA	1,470,178	977,458	1,256,387	752,220	1,039,275	1,099,104
Maryland	1,488,266	2,509,474	1,322,648	667,463	1,264,851	1,450,540

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	0	33,942	0	0	0	6,788
Baltimore, City	24,000	115,441	668,000	122,000	42,704	194,429
Baltimore, MSA	798,466	855,906	1,253,496	360,170	287,584	711,124
Maryland	1,067,306	2,122,238	1,748,495	1,464,999	569,420	1,394,492

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	28.5%	27.9%	26.1%	26.2%	26.6%	27.0%
Baltimore, City	16.5%	15.0%	13.8%	11.6%	11.7%	13.7%
Baltimore, MSA	15.4%	14.5%	13.7%	12.1%	11.1%	13.4%
Maryland	14.7%	14.0%	14.0%	14.3%	13.9%	14.2%

Average Annual Direct Rent (fs)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$27.07	\$20.99	\$20.27	\$20.27	\$26.50	\$23.02
Baltimore, City	\$23.09	\$22.94	\$22.04	\$21.91	\$24.32	\$22.86
Baltimore, MSA	\$24.80	\$24.86	\$24.24	\$23.89	\$25.75	\$24.71
Maryland	\$27.76	\$27.34	\$27.05	\$26.63	\$27.56	\$27.27

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





Table C. 8: Class B Office Real Estate Market Performance

Summary Profile of Class-B Office Market

Summary Data - Q3 2015 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (fs)	
Study Area	20	249,505	17.1%	\$24.72	
Baltimore, City	766	25,823,084	10.0%	\$19.71	
Baltimore, MSA	2,723	65,670,465	11.4%	\$20.69	
Maryland	6,317	185,757,550	12.1%	\$21.69	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	249,505	249,505	249,505	249,505	249,505	249,505
Baltimore, City	26,060,560	25,966,745	26,058,395	26,020,036	25,823,084	25,985,764
Baltimore, MSA	64,946,077	65,027,672	65,438,729	65,530,089	65,670,465	65,322,606
Maryland	184,995,053	185,162,794	185,709,513	185,813,369	185,757,550	185,487,656

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	(9,569)	(388)	(7,024)	13,696	(14,685)	(3,594)
Baltimore, City	(4,820)	137,459	56,341	(634,948)	(16,786)	(92,551)
Baltimore, MSA	223,942	273,918	39,469	(181,483)	353,886	141,946
Maryland	457,467	32,459	284,357	511,006	934,378	443,933

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	0	0	0	0	0	0
Baltimore, City	17,634	0	16,200	214,897	24,800	54,706
Baltimore, MSA	483,112	209,664	382,332	224,897	393,583	338,718
Maryland	805,216	354,813	521,628	579,976	364,625	525,252

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	12.9%	13.4%	16.5%	15.3%	19.1%	15.4%
Baltimore, City	9.1%	8.3%	8.7%	11.0%	10.1%	9.4%
Baltimore, MSA	10.9%	10.7%	11.1%	11.8%	11.4%	11.2%
Maryland	12.5%	12.7%	12.7%	12.6%	12.2%	12.5%

Average Annual Direct Rent (fs)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$20.80	\$21.41	\$20.55	\$22.85	\$24.13	\$21.95
Baltimore, City	\$17.75	\$17.77	\$18.89	\$19.51	\$19.75	\$18.73
Baltimore, MSA	\$19.97	\$20.06	\$20.77	\$20.60	\$20.96	\$20.47
Maryland	\$21.18	\$21.07	\$21.70	\$21.71	\$21.95	\$21.52

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





Table C. 9: Retail Real Estate Market Performance

Summary Profile of Retail Market

Summary Data - Q3 2015 to Date					
Study Area	Number of Buildings	Total RBA /1	Vacancy Rate /2	Average Rental Rate (nnn)	
Study Area	369	1,824,496	1.2%	\$11.62	
Baltimore, City	5,380	39,648,077	4.5%	\$14.19	
Baltimore, MSA	12,315	138,849,771	4.7%	\$18.26	
Maryland	23,253	287,550,252	5.0%	\$17.94	

Rentable Building Area as of 4Q (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	1,954,221	1,954,221	1,957,231	1,957,231	1,824,496	1,929,480
Baltimore, City	39,560,003	39,696,244	39,875,889	39,784,622	39,648,077	39,712,967
Baltimore, MSA	136,764,289	137,998,100	138,267,781	138,408,279	138,849,771	138,057,644
Maryland	283,477,455	285,271,954	285,491,119	286,256,907	287,550,252	285,609,537

Direct Net Absorption (Sq. Ft.), Annual Totals						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	25,579	(17,614)	33,928	25,528	5,660	14,616
Baltimore, City	190,273	290,252	214,053	(149,960)	155,452	140,014
Baltimore, MSA	513,579	1,822,294	997,365	626,106	123,264	816,522
Maryland	1,363,218	2,198,394	910,913	1,388,691	2,912	1,172,826

RBA Delivered, Annual Totals (Sq. Ft.)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	5,125	0	3,010	0	0	1,627
Baltimore, City	20,942	16,500	255,960	99,827	65,044	91,655
Baltimore, MSA	432,782	1,166,536	566,539	686,349	664,579	703,357
Maryland	1,604,397	1,752,567	1,913,557	1,894,440	992,506	1,631,493

Average Annual Direct Vacancy Rate						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	10.1%	10.9%	10.4%	8.6%	1.4%	8.3%
Baltimore, City	5.7%	5.2%	5.1%	5.2%	4.5%	5.1%
Baltimore, MSA	5.9%	5.5%	5.0%	4.7%	4.7%	5.1%
Maryland	5.8%	5.6%	5.4%	5.3%	5.1%	5.4%

Average Annual Direct Rent (nnn)						
	2011	2012	2013	2014	2015	Avg Annual
Study Area	\$10.62	\$11.41	\$11.66	\$13.51	\$10.46	\$11.53
Baltimore, City	\$14.81	\$14.51	\$14.77	\$13.65	\$14.48	\$14.44
Baltimore, MSA	\$17.15	\$17.56	\$18.31	\$17.49	\$18.09	\$17.72
Maryland	\$17.47	\$17.31	\$17.68	\$17.31	\$17.90	\$17.53

1/ Rentable Building Area

2/ Does not include Sublet Vacancy

Source: CoStar Property, AECOM, April 2016





APPENDIX D

BRIDGE COST ESTIMATES





Hanover Street Corridor Study - Deck Replacement Option 1 - Deck Replacement (excludes Precast Deck Planks) - Approach Spans/ Roadway Only (Approach Roadway Work - Not Included)					
Item	Unit	Quantity	Unit Price	Cost	
Deck Demolition					
South Abutment	SF	3,975	\$15	\$59,625	
South Arch Spans	SF	39,793	\$15	\$596,889	
North Arch Spans	SF	39,775	\$15	\$596,628	
North Arcade Spans	SF	26,864	\$15	\$402,957	
North Retaining Wall Section	SF	15,231	\$15	\$228,465	
Total		125,638		\$1,884,564	
Concrete Deck*					
South Abutment - 4 3/4" Slab on Deck Plank	CY	57	\$750	\$43,063	
South Arch Spans - 4 3/4" Slab on Deck Plank	CY	575	\$750	\$431,087	
North Arch Spans - 4 3/4" Slab on Deck Plank	CY	575	\$750	\$430,898	
North Arcade Spans	CY	368	\$750	\$276,100	
North Retaining Wall Section	CY	209	\$750	\$156,541	
Total		1,784		\$1,337,688	
* Unit price includes Bearing Pads and P/T Rods					
Epoxy Coated Reinforcement	LB	445,896	\$2.10	\$936,382	
Remove and Replace Scuppers	EA	68	\$2,500	\$170,000	
Replace Joint Seals	LF	1600	\$50	\$80,000	
Replace Joint Armor	LF	1200	\$100	\$120,000	
Pavement Striping	LS	1	\$50,000	\$50,000	
Subtotal Construction				\$4,578,634	
Maintenance of Traffic			10% Construction	\$457,863	
Architectural and Engineering Fees (Includes CMI and soft costs)			20% Construction	\$915,727	
Mobilization	LS	1	5% Construction	\$228,932	
Estimated Cost of Work				\$6,181,155	
Contingencies					
40% Comprehensive (Includes 1 year escalation at 4%)				\$2,472,462	
Total Project Cost				\$8,653,618	





Hanover Street Corridor Study - Deck Replacement Option 2- Hydrodemolition with Overlay - Approach Spans/ Roadway Only (Approach Roadway Work - Not Included)				
Item	Unit	Quantity	Unit Price	Cost
Deck Demolition and LMC Overlay				
South Abutment	SF	3,975	\$25	\$99,375
South Arch Spans	SF	39,793	\$25	\$994,815
North Arch Spans	SF	39,775	\$25	\$994,380
North Arcade Spans	SF	26,864	\$25	\$671,595
North Retaining Wall Section	SF	15,231	\$25	\$380,775
Total		125,638		\$3,140,940
Remove and Replace Scupper Grates	EA	68	\$1,500	\$102,000
Replace Joint Seals	LF	1600	\$50	\$80,000
Pavement Striping	LS	1	\$50,000	\$50,000
Subtotal Construction				\$3,372,940
Maintenance of Traffic			10% Construction	\$337,294
Architectural and Engineering Fees <i>(Includes GMI and soft costs)</i>			20% Construction	\$674,588
Mobilization	LS	1	5% Construction	\$168,647
Estimated Cost of Work				\$4,553,469
Contingencies				
40% Comprehensive <i>(Includes 1 year escalation at 4%)</i>				\$1,821,388
Total Project Cost				\$6,374,857





Hanover Street Corridor Study - Deck Replacement Option 3 - Full Deck Replacement - Entire Bridge w/ Additional Barriers * No Rehabilitation of the Movable Span (Approach Roadway Work - Not Included)				
Item	Unit	Quantity	Unit Price	Cost
Deck Demolition				
South Abutment	SF	4,770	\$15	\$71,550
South Arch Spans	SF	47,751	\$15	\$716,267
North Arch Spans	SF	47,730	\$15	\$715,954
North Arcade Spans	SF	32,237	\$15	\$483,548
North Retaining Wall Section	SF	18,277	\$15	\$274,158
Total		150,765		\$2,261,477
Concrete Deck*				
South Abutment - 8" deck (plank plus slab)	CY	118	\$750	\$88,775
South Arch Spans - 8" deck (plank plus slab)	CY	1,185	\$750	\$888,701
North Arch Spans - 8" deck (plank plus slab)	CY	1,184	\$750	\$888,313
North Arcade Spans	CY	1,636	\$750	\$1,226,780
12" Precast Plank w/ 4 1/2" slab				
North Retaining Wall Section	CY	589	\$750	\$441,699
6" Precast Plank w/ 4 1/2" slab				
Total		4,712		\$3,534,268
<i>* Unit price includes Bearing Pads and P/T Rods</i>				
Epoxy Coated Reinforcement	LB	1,178,089	\$2.10	\$2,473,988
Remove Existing Grid Deck	SF	12,821	\$10.00	\$128,213
<i>Includes Sidewalks and Rails</i>				
Steel Grid Deck	SF	6,900	\$75.00	\$517,500
Concrete Filled Steel Grid Deck	SF	5,921	\$100.00	\$592,128
<i>Counterweight and Sidewalk Areas</i>				
Concrete Texas Barrier (Approaches)	LF	3,780	\$500.00	\$1,890,000
Steel Bridge Rail (Bascule)	LF	300	\$250.00	\$75,000
Concrete Traffic Barrier (Approaches)	LF	5,730	\$400.00	\$2,292,000
Steel Traffic Barrier (Bascule)	LF	590	\$1,000.00	\$589,500
Period Lamp Posts	EA	36	\$5,000.00	\$180,000
Electrical System and Conduits	LS	1	\$250,000.00	\$250,000
Remove and Replace Scuppers	EA	68	\$2,500	\$170,000
Replace Joint Seals	LF	1600	\$50	\$80,000
Replace Joint Armor	LF	1600	\$100	\$160,000
Pavement Striping	LS	1	\$50,000	\$50,000
Subtotal Construction				\$15,244,074
Maintenance of Traffic			10% Construction	\$1,524,407
Architectural and Engineering Fees <i>(Includes CM and soft costs)</i>			20% Construction	\$3,048,815
Mobilization	LS	1	5% Construction	\$762,204
Estimated Cost of Work				\$20,579,500
Contingencies				
40% Comprehensive <i>(Includes 1 year escalation at 4%)</i>				\$8,231,800
Total Project Cost				\$28,811,300





Hanover Street Corridor Study - Full Rehabilitation

Option 3 - Full Deck Replacement - Entire Bridge w/ Additional Barriers

** Fix the Movable Span in the Closed Position*

(Approach Roadway Work - Not Included)

- * Start with estimate for full rehabilitation of the moveable span (\$66,611,300)
- * Delete cost of mechanical and electrical operating system of movable span from rehabilitation cost
- * Delete MOT, fees, mobilization, and contingencies from movable span rehabilitation cost

\$66,611,300 (full movable span rehabilitation cost)

Delete \$11,000,000 (1.35 MOT, Fees, and Mobilization) (1.40 Contingencies)

Total Project Cost = \$45,821,300





Hanover Street Corridor Study - Full Rehabilitation Option 3 - Full Deck Replacement - Entire Bridge w/ Additional Barriers * Full Rehabilitation of the Movable Span (Approach Roadway Work - Not Included)				
Item	Unit	Quantity	Unit Price	Cost
Deck Demolition				
South Abutment	SF	4,770	\$15	\$71,550
South Arch Spans	SF	47,751	\$15	\$716,267
North Arch Spans	SF	47,730	\$15	\$715,954
North Arcade Spans	SF	32,237	\$15	\$483,548
North Retaining Wall Section	SF	18,277	\$15	\$274,158
Total		150,765		\$2,261,477
Concrete Deck*				
South Abutment - 8" deck (plank plus slab)	CY	118	\$750	\$88,775
South Arch Spans - 8" deck (plank plus slab)	CY	1,185	\$750	\$888,701
North Arch Spans - 8" deck (plank plus slab)	CY	1,184	\$750	\$888,313
North Arcade Spans	CY	1,636	\$750	\$1,226,780
12" Precast Plank w/4 1/2" slab				
North Retaining Wall Section	CY	589	\$750	\$441,699
6" Precast Plank w/4 1/2" slab				
Total		4,712		\$3,534,268
*Unit price includes Bearing Pads and P/T Rods				
Epoxy Coated Reinforcement	LB	1,178,089	\$2.10	\$2,473,988
Remove Existing Grid Deck	SF	12,821	\$10	\$128,213
Includes Sidewalks and Rails				
Steel Grid Deck	SF	6,900	\$75	\$517,500
Concrete Filled Steel Grid Deck	SF	5,921	\$100	\$592,128
Counterweight and Sidewalk Areas				
Concrete Texas Barrier (Approaches)	LF	3,780	\$500	\$1,890,000
Steel Bridge Rail (Bascule)	LF	300	\$250	\$75,000
Concrete Traffic Barrier (Approaches)	LF	5,730	\$400	\$2,292,000
Steel Traffic Barrier (Bascule)	LF	590	\$1,000	\$589,500
Period Lamp Posts	EA	36	\$5,000	\$180,000
Electrical System and Conduits	LS	1	\$250,000	\$250,000
Remove and Replace Scuppers	EA	68	\$2,500	\$170,000
Replace Joint Seals	LF	1600	\$50	\$80,000
Replace Joint Armor	LF	1600	\$100	\$160,000
Pavement Striping	LS	1	\$50,000	\$50,000
Subtotal Deck Replacement Construction				\$15,244,074
General Structural Rehabilitation*	LS	1	\$9,000,000	\$9,000,000
Mechanical Operating System Rehabilitation**	LS	1	\$1,000,000	\$1,000,000
Electrical Operating System Replacement**	LS	1	\$10,000,000	\$10,000,000
* 2015 Bridge Inspection Report				
** 2014 Mechanical/ Electrical Inspection Report				
Total Rehabilitation Construction				\$35,244,074
Maintenance of Traffic			10% Construction	\$3,524,407
Architectural and Engineering Fees (Includes CMI and soft costs)			20% Construction	\$7,048,815
Mobilization	LS	1	5% Construction	\$1,762,204
Estimated Cost of Work				\$47,579,500
Contingencies				
40% Comprehensive (Includes 1 year escalation at 4%)				\$19,031,800
Total Project Cost				\$66,611,300





Hanover Street Corridor Study - Full Rehabilitation

Option 4 - Separate Pedestrian / Bicycle Bridge and General Rehabilitation of the Existing Bridge to Accommodate Six Travel Lanes

(Approach Roadway Work - Not Included)

- * Start with estimate to fix the movable span in the closed position (\$45,821,300)
- * Add cost of separate pedestrian / bicycle bridge

Pedestrian / bicycle bridge

2,300 Feet Long, 18 Feet Out-to-Out

\$400/SF

15% added for soft costs and engineering, 5% added for mobilization

Total pedestrian / bicycle bridge cost = $2,300 \times 18 \times \$400 \times 1.2$

Total pedestrian / bicycle bridge cost = \$19,872,000

Fix the movable span in the closed position + new pedestrian / bicycle bridge

Total Project Cost = \$45,821,300 + \$19,872,000

Total Project Cost = \$65,693,300





Hanover Street Corridor Study - Replacement

Option 5 - New Six-Lane Bridge and Demolition of Existing Bridge

(Approach Roadway Work - Not Included)

New Six-Lane Bridge

105 feet out-to-out

1,600 feet at \$1,000 per SF (arches and movable span)

400 feet at \$400 per SF (arcades)

300 feet at \$250 per SF (filled retaining walls)

15% added for soft costs and engineering, 5% added for mobilization

Total six-lane signature bridge cost = $105 \times (1,600 \times \$1000 + 400 \times \$400 + 300 \times \$250) \times 1.2$

Total six-lane signature bridge cost = \$231,000,000

Demolition of Existing Bridge

2,300 feet long, 72 feet out-to-out

\$75/SF

Total demolition cost = $2,300 \times 72 \times \$75$

Total demolition cost = \$12,420,000

New Six-Lane Bridge and Demolition of Existing Bridge

Total Project Cost = \$231,000,000 + \$12,420,000

Total Project Cost = \$243,420,000





Hanover Street Corridor Study - Replacement

Option 6 - New Four-Lane Bridge and Demolition of Existing Bridge

(Approach Roadway Work - Not Included)

New Four-Lane Bridge

* Same cost estimate methodology as Option 5 (new six-lane bridge), but 24' less wide

Six-lane bridge: 104 feet total (with additional two feet for the rails)

Four-lane bridge: 80 feet (deduct 24 feet/two 12-foot lanes from the six-lane width)

Total four-lane signature bridge cost = $80'/104' \times \$231$ million

Total four-lane signature bridge cost = \$177.7 million

Demolition of Existing Bridge

2,300 feet long, 72 feet out-to-out

\$75/SF

Total demolition cost = $2,300 \times 72 \times \$75$

Total demolition cost = \$12,420,000

New Four-Lane Bridge and Demolition of Existing Bridge

Total Project Cost = \$177,700,000 + \$12,420,000

Total Project Cost = \$190,120,000





APPENDIX E

CORRIDOR COST ESTIMATES





DATE:	March 11, 2018	COUNTY:	Baltimore City
ROUTE:	Hanover Street (Wells Street to Reedbird Avenue)	PRJ LENGTH:	1.4 miles
JOB DESCRP:	BCDOT Hanover Street Corridor Study	PREPARED BY:	AECOM
ALTERNATE:	Hanover Street Corridor (without VVMB) - Low Option		

CAT. CODE	CAT. 1 (PRELIMINARY) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
100000	PRELIMINARY (17% Categories 2, 4, 5, and 6) <i>Includes Maintenance of Traffic, Mobilization, Engineer's Office, CPM Schedule, Construction Stakeout, Clearing and Grubbing, Engineer's Boat</i>	1	LS	\$ 455,260.00	\$ 455,260	
CONTINGENCY					40%	\$ 182,104
SUBTOTAL CATEGORY 1 COST					\$ 637,364	

CAT. CODE	CAT. 2 (GRADING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
210025	REMOVAL OF EXISTING PAVEMENT- NORTH OF BRIDGE (24,062 SF)	1,485	CY	\$ 37.00	\$ 54,945	
210025	REMOVAL OF EXISTING PAVEMENT- SOUTH OF BRIDGE (65,609 SF)	4,050	CY	\$ 37.00	\$ 149,850	
210025	REMOVAL OF 50% OF EXISTING SIDEWALK- SOUTH OF BRIDGE (NORTHBOUND 10,000 SF)	185	CY	\$ 32.00	\$ 5,920	
210025	REMOVAL OF 30% OF EXISTING SIDEWALK- SOUTH OF BRIDGE (SOUTHBOUND 6,050 SF)	112	CY	\$ 32.00	\$ 3,584	
CONTINGENCY					40%	\$ 85,720
SUBTOTAL CATEGORY 2 COST					\$ 300,019	

CAT. CODE	CAT. 3 (DRAINAGE) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
300000	DRAINAGE (15% Categories 2, 5, and 6) - excludes SWM	1	LS	\$ 334,800.00	\$ 334,800	
300000	SWM FACILITIES (5% Categories 2, 5, and 6) Treat ex. and new impervious area	1	LS	\$ 111,600.00	\$ 111,600	
300000	EROSION AND SEDIMENT CONTROL (2% Categories 2, 5, and 6)	1	LS	\$ 44,640.00	\$ 44,640	
CONTINGENCY					40%	\$ 178,560
SUBTOTAL CATEGORY 3 COST					\$ 669,600	

CAT. CODE	CAT. 4 (STRUCTURES) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
400000	SEE SEPARATE ESTIMATE(S) FOR BRIDGE OPTION(S)					
CONTINGENCY					40%	\$ -
SUBTOTAL CATEGORY 4 COST					\$ -	

CAT. CODE	CAT. 5 (PAVING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
504530	SUPERPAVE ASPHALT MIX 12.5MM FOR SURFACE, PG 64S-22, LEVEL 2 (SOUTH OF BRIDGE)	5,000	TON	\$ 80.00	\$ 400,000	
530111	GRINDING ASPHALT PAVEMENT 2 INCH TO 4 INCH (SOUTH OF BRIDGE 202,134 SF)	22,459	SY	\$ 5.00	\$ 112,295	
560111	CONCRETE PAVEMENT- TO 375' NORTH OF BRIDGE (11" PCC)	2,700	SY	\$ 100.00	\$ 270,000	
560111	CONCRETE PAVEMENT- TO 800' SOUTH OF BRIDGE (11" PCC)	7,300	SY	\$ 100.00	\$ 730,000	
520113	6 INCH GRADED AGGREGATE BASE COURSE 375' NORTH OF BRIDGE (6" GAB)	2,800	SY	\$ 12.00	\$ 33,600	
520113	6 INCH GRADED AGGREGATE BASE COURSE 375' NORTH OF BRIDGE (6" GAB)	7,660	SY	\$ 12.00	\$ 91,920	
CONTINGENCY					40%	\$ 655,126
SUBTOTAL CATEGORY 5 COST					\$ 2,292,941	

CAT. CODE	CAT. 6 (SHOULDERS) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
634101	STANDARD TYPE A CURB AND GUTTER- NORTH OF BRIDGE	1,000	LF	\$ 32.00	\$ 32,000	
634101	STANDARD TYPE A CURB AND GUTTER- SOUTH OF BRIDGE	10,000	LF	\$ 32.00	\$ 320,000	
655105	5 INCH CONCRETE SIDEWALK- NORTH OF BRIDGE (5' MIN. WIDTH, 500 LF)	2,500	SF	\$ 14.00	\$ 35,000	
655105	5 INCH CONCRETE SIDEWALK- SOUTH OF BRIDGE (5' MIN. WIDTH, 2,550 LF)	12,750	SF	\$ 14.00	\$ 178,500	
655120	DETECTABLE WARNING SURFACE FOR CURB RAMP	400	SF	\$ 48.00	\$ 19,200	
600000	BUS SHELTER WITH CONCRETE PAD	5	EA	\$ 35,000.00	\$ 175,000	
600000	BUS SHELTER BENCH	11	EA	\$ 1,600.00	\$ 17,600	
600000	BIKE RACKS AT BUS SHELTERS AND RECREATION AREAS	10	EA	\$ 650.00	\$ 6,500	
600000	TRASH RECEPTACLES AT BUS SHELTERS	15	EA	\$ 1,500.00	\$ 22,500	
600000	STAIRWAY REPLACEMENT- SOUTHEAST OF BRIDGE	1	LS	\$ 85,000.00	\$ 85,000	
CONTINGENCY					40%	\$ 356,520
SUBTOTAL CATEGORY 6 COST					\$ 1,247,820	





DATE:	March 11, 2018	COUNTY:	Baltimore City
ROUTE:	Hanover Street (Wells Street to Reedbird Avenue)	PRJ LENGTH:	1.4 miles
JOB DESCRP:	BCDOT Hanover Street Corridor Study	PREPARED BY:	AECOM
ALTERNATE:	Hanover Street Corridor (without VVMB) - Low Option		

CAT. CODE	CAT. 7 (LANDSCAPING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
700000	STREET TREES- NORTH OF BRIDGE	10	EA	\$ 1,200.00	\$ 12,000
700000	STREET TREES- SOUTH OF BRIDGE	30	EA	\$ 1,200.00	\$ 36,000
708220	TURFGRASS SOD ESTABLISHMENT	5,000	SY	\$ 10.00	\$ 50,000

CONTINGENCY				40%	\$ 39,200
SUBTOTAL CATEGORY 7 COST					\$ 137,200

CAT. CODE	CAT. 8 (TRAFFIC) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
800000	TRAFFIC SIGNALS (UPGRADE TO MAST ARMS)	7	EA	\$ 250,000.00	\$ 1,750,000
800000	PAVEMENT MARKINGS	1	LS	\$ 30,000.00	\$ 30,000
600000	CROSSWALKS (STAMPED BRICK PATTERN WITH COATING)	27	EA	\$ 7,200.00	\$ 194,400
800000	SIGNING	1	LS	\$ 15,000.00	\$ 15,000

CONTINGENCY				40%	\$ 795,760
SUBTOTAL CATEGORY 8 COST					\$ 2,785,160

CAT. CODE	CAT. 9 (UTILITIES) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
900000	UTILITIES (5% Categories 2, 3, 4, 5, 6, 7, 8)	1	LS	\$ 240,500.00	\$ 240,500

CONTINGENCY				40%	\$ 96,200
SUBTOTAL CATEGORY 9 COST					\$ 336,700

CATEGORY	DESCRIPTION	TOTAL
1	PRELIMINARY	\$ 637,364
2	GRADING	\$ 300,019
3	DRAINAGE	\$ 669,600
4	STRUCTURES	\$ -
5	PAVING	\$ 2,292,941
6	SHOULDERS	\$ 1,247,820
7	LANDSCAPING	\$ 137,200
8	TRAFFIC	\$ 2,785,160
9	UTILITIES	\$ 336,700
TOTAL		\$ 8,406,804

8% ADMINISTRATIVE OVERHEAD	\$ 672,545
17.6% PRELIMINARY ENGINEERING	\$ 1,479,598

Notes:

- 1) Conceptual level - additional engineering required
- 2) Assumes no right-of-way costs
- 3) Contingency is 40% Comprehensive (includes 1-year escalation at 4%)





DATE:	February 12, 2018	COUNTY:	Baltimore City
ROUTE:	Hanover Street (Wells Street to Reedbird Avenue)	PRJ LENGTH:	1.4 miles
JOB DESCRP:	BCDOT Hanover Street Corridor Study	PREPARED BY:	AECOM
ALTERNATE:	Hanover Street Corridor (without VVMB) - High Option		

CAT. CODE	CAT. 1 (PRELIMINARY) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
100000	PRELIMINARY (45% Categories 2, 4, 5, and 6) <i>Includes Maintenance of Traffic, Mobilization, Engineer's Office, CPM Schedule, Construction Stakeout, Clearing and Grubbing, Engineer's Boat</i>	1	LS	\$ 1,772,550.00	\$ 1,772,550
CONTINGENCY					40%
SUBTOTAL CATEGORY 1 COST					\$ 2,481,570

CAT. CODE	CAT. 2 (GRADING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
210025	REMOVAL OF EXISTING PAVEMENT- NORTH OF BRIDGE (24,062 SF)	1,485	CY	\$ 37.00	\$ 54,945
210025	REMOVAL OF EXISTING PAVEMENT- SOUTH OF BRIDGE (65,609 SF)	4,050	CY	\$ 37.00	\$ 149,850
210025	REMOVAL OF EXISTING SIDEWALK- SOUTH OF BRIDGE (NORTHBOUND 21,335 SF)	330	CY	\$ 32.00	\$ 10,560
210025	REMOVAL OF EXISTING SIDEWALK- SOUTH OF BRIDGE (SOUTHBOUND 20,155 SF)	306	CY	\$ 32.00	\$ 9,792
CONTINGENCY					40%
SUBTOTAL CATEGORY 2 COST					\$ 315,206

CAT. CODE	CAT. 3 (DRAINAGE) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
300000	DRAINAGE (40% Categories 2, 5, and 6) - <i>excludes SWM</i>	1	LS	\$ 1,335,600.00	\$ 1,335,600
300000	SWM FACILITIES (8% Categories 2, 5, and 6) <i>Treat ex. and new impervious area</i>	1	LS	\$ 267,120.00	\$ 267,120
300000	EROSION AND SEDIMENT CONTROL (2% Categories 2, 5, and 6)	1	LS	\$ 66,780.00	\$ 66,780
CONTINGENCY					40%
SUBTOTAL CATEGORY 3 COST					\$ 2,310,588

CAT. CODE	CAT. 4 (STRUCTURES) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
400000	SEE SEPARATE ESTIMATE(S) FOR BRIDGE OPTION(S)				
400000	STAIR TOWERS (NORTH END OF BRIDGE WITH ARCADE - NO ELEVATORS)	2	EA	\$ 300,000.00	\$ 600,000
CONTINGENCY					40%
SUBTOTAL CATEGORY 4 COST					\$ 840,000

CAT. CODE	CAT. 5 (PAVING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
504530	SUPERPAVE ASPHALT MIX 12.5MM FOR SURFACE, PG 64S-22, LEVEL 2 (SOUTH OF BRIDGE)	5,000	TON	\$ 80.00	\$ 400,000
530111	GRINDING ASPHALT PAVEMENT 2 INCH TO 4 INCH (SOUTH OF BRIDGE 202,134 SF)	22,459	SY	\$ 5.00	\$ 112,295
560111	CONCRETE PAVEMENT- TO 375' NORTH OF BRIDGE (11" PCC)	2,700	SY	\$ 100.00	\$ 270,000
560111	CONCRETE PAVEMENT- TO 800' SOUTH OF BRIDGE (11" PCC)	7,300	SY	\$ 100.00	\$ 730,000
520113	6 INCH GRADED AGGREGATE BASE COURSE 375' NORTH OF BRIDGE (6" GAB)	2,800	SY	\$ 12.00	\$ 33,600
520113	6 INCH GRADED AGGREGATE BASE COURSE 375' NORTH OF BRIDGE (6" GAB)	7,660	SY	\$ 12.00	\$ 91,920
CONTINGENCY					40%
SUBTOTAL CATEGORY 5 COST					\$ 2,292,941

CAT. CODE	CAT. 6 (SHOULDERS) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
634101	STANDARD TYPE A CURB AND GUTTER- NORTH OF BRIDGE	1,000	LF	\$ 32.00	\$ 32,000
634101	STANDARD TYPE A CURB AND GUTTER- SOUTH OF BRIDGE	10,000	LF	\$ 32.00	\$ 320,000
655105	5 INCH CONCRETE SIDEWALK- NORTH OF BRIDGE (6' WIDTH, 1,000 LF)	6,000	SF	\$ 14.00	\$ 84,000
655105	5 INCH CONCRETE SIDEWALK- SOUTH OF BRIDGE (6' WIDTH, 8,500 LF)	51,000	SF	\$ 14.00	\$ 714,000
655120	DETECTABLE WARNING SURFACE FOR CURB RAMPS	400	SF	\$ 48.00	\$ 19,200
600000	BUS SHELTER WITH CONCRETE PAD	5	EA	\$ 35,000.00	\$ 175,000
600000	BUS SHELTER BENCH	11	EA	\$ 1,600.00	\$ 17,600
600000	BIKE RACKS AT BUS SHELTERS AND RECREATION AREAS	10	EA	\$ 650.00	\$ 6,500
600000	TRASH RECEPTACLES AT BUS SHELTERS	15	EA	\$ 1,500.00	\$ 22,500
600000	STAIRWAY REPLACEMENT- SOUTHEAST OF BRIDGE	1	LS	\$ 85,000.00	\$ 85,000
CONTINGENCY					40%
SUBTOTAL CATEGORY 6 COST					\$ 2,066,120





DATE:	February 12, 2018	COUNTY:	Baltimore City
ROUTE:	Hanover Street (Wells Street to Reedbird Avenue)	PRJ LENGTH:	1.4 miles
JOB DESCRP:	BCDOT Hanover Street Corridor Study	PREPARED BY:	AECOM
ALTERNATE:	Hanover Street Corridor (without VVMB) - High Option		

CAT. CODE	CAT. 7 (LANDSCAPING) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
700000	STREET TREES- NORTH OF BRIDGE	24	EA	\$ 1,200.00	\$ 28,800	
700000	STREET TREES- SOUTH OF BRIDGE	80	EA	\$ 1,200.00	\$ 96,000	
708220	TURFGRASS SOD ESTABLISHMENT	5,000	SY	\$ 10.00	\$ 50,000	
ARCADE IMPROVEMENTS- NORTH END OF BRIDGE						
700000	WALL ART ALLOWANCE	1	LS	\$ 75,000.00	\$ 75,000	
700000	CEILING ART ALLOWANCE	1	LS	\$ 200,000.00	\$ 200,000	
700000	BOCCE COURTS	4	EA	\$ 32,000.00	\$ 128,000	
700000	PICNIC TABLES	10	EA	\$ 2,500.00	\$ 25,000	
700000	CHAIRS	50	EA	\$ 500.00	\$ 25,000	
700000	BENCHES	18	EA	\$ 2,500.00	\$ 45,000	
700000	ESCOFET LUNGO BENCHES (PROPRIETARY CUSTOM CAST STONE)	3	EA	\$ 10,000.00	\$ 30,000	
700000	PERVIOUS PAVEMENT (ASPHALT, CONCRETE OR PROPRIETARY)	51,000	SF	\$ 22.00	\$ 1,122,000	
700000	DECORATIVE PEDESTRIAN LIGHTS	5	EA	\$ 10,000.00	\$ 50,000	
700000	BRIDGE UPLIGHTING (UNDER BRIDGE)	1	LS	\$ 50,000.00	\$ 50,000	
ARCADE IMPROVEMENTS- SOUTH END OF BRIDGE						
210025	REMOVAL OF EXISTING PAVEMENT	1,000	CY	\$ 37.00	\$ 37,000	
700000	WALL ART ALLOWANCE	1	LS	\$ 100,000.00	\$ 100,000	
700000	BENCHES	25	EA	\$ 2,500.00	\$ 62,500	
700000	ESCOFET LUNGO BENCHES (CUSTOM CAST STONE)	3	EA	\$ 10,000.00	\$ 30,000	
700000	DECORATIVE PEDESTRIAN LIGHTS	75	EA	\$ 10,000.00	\$ 750,000	
700000	BRIDGE UPLIGHTING (UNDER BRIDGE)	1	LS	\$ 110,000.00	\$ 110,000	
700000	PROMENADE DECK	29,632	SF	\$ 25.00	\$ 740,800	
700000	HANDRAIL (STEEL, ILLUMINATED)	525	LF	\$ 400.00	\$ 210,000	
700000	AMPHITHEATRE (GRADING, BACKFILL, SEAT WALLS, STEPS, HANDRAIL)	1	LS	\$ 740,000.00	\$ 740,000	
700000	CONCRETE WALK REPLACEMENT	1	LS	\$ 580,000.00	\$ 580,000	
700000	PAVER WALKWAY REPLACEMENT	1	LS	\$ 187,000.00	\$ 187,000	
700000	MEADOW ESTABLISHMENT (GRADING, PREPARATION, SOIL AMENDMENTS)	8,000	SY	\$ 10.00	\$ 80,000	
708220	TURFGRASS SOD ESTABLISHMENT	4,000	SY	\$ 7.00	\$ 28,000	
700000	VVMB MONUMENTAL MARKERS AT NORTH AND SOUTH ENDS OF BRIDGE	2	EA	\$ 75,000.00	\$ 150,000	
CONTINGENCY					40%	\$ 2,292,040
SUBTOTAL CATEGORY 7 COST						\$ 8,022,140

CAT. CODE	CAT. 8 (TRAFFIC) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
800000	TRAFFIC SIGNALS (UPGRADE TO MAST ARMS)	7	EA	\$ 250,000.00	\$ 1,750,000	
800000	PAVEMENT MARKINGS	1	LS	\$ 30,000.00	\$ 30,000	
600000	CROSSWALKS (STAMPED BRICK PATTERN WITH COATING)	27	EA	\$ 7,200.00	\$ 194,400	
800000	SIGNING	1	LS	\$ 15,000.00	\$ 15,000	
CONTINGENCY					40%	\$ 795,760
SUBTOTAL CATEGORY 8 COST						\$ 2,785,160

CAT. CODE	CAT. 9 (UTILITIES) - DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	
900000	UTILITIES (15% Categories 2, 3, 4, 5, 6, 7, 8)	1	LS	\$ 1,999,200.00	\$ 1,999,200	
900000	PEDESTRIAN LIGHTING- NORTH OF BRIDGE	23	EA	\$ 8,000.00	\$ 184,000	
900000	PEDESTRIAN LIGHTING- SOUTH OF BRIDGE	136	EA	\$ 8,000.00	\$ 1,088,000	
900000	DECORATIVE BRIDGE UPLIGHTING (BRIDGE FACADE)	1	LS	\$ 150,000.00	\$ 150,000	
CONTINGENCY					40%	\$ 1,368,480
SUBTOTAL CATEGORY 9 COST						\$ 4,789,680

CATEGORY	DESCRIPTION	TOTAL
1	PRELIMINARY	\$ 2,481,570
2	GRADING	\$ 315,206
3	DRAINAGE	\$ 2,310,588
4	STRUCTURES	\$ 840,000
5	PAVING	\$ 2,292,941
6	SHOULDERS	\$ 2,066,120
7	LANDSCAPING	\$ 8,022,140
8	TRAFFIC	\$ 2,785,160
9	UTILITIES	\$ 4,789,680
TOTAL		\$ 25,903,405

8% ADMINISTRATIVE OVERHEAD	\$ 2,072,273
17.6% PRELIMINARY ENGINEERING	\$ 4,559,000

Notes:

- 1) Conceptual level - additional engineering required
- 2) Assumes no right-of-way costs

